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DISEASES CAUSED BY BACTERIA AND FUNGI

Fleming, L. W. (1960). **Studies on bovine staphylococcal mastitis. Formulation of immunizing agents.**—Vet. Med. **55**, No. 10 pp. 72-76. **1319**

This paper describes attempts to develop a toxoid inactivated by beta-propiolactone. The best of several media for toxin production was brain-heart infusion. Toxoid prepared from four strains of staphylococci was inoculated into rabbits and ten cows (two 5 ml. doses i/m at an interval of 2 weeks). Ten days after the second injection the antitoxin concentration in cow serum ranged from 2–40 units/ml. of alpha toxin and 3–40 of beta toxin. The toxoid was more active in this respect than formaldehyde-inactivated toxoid.
—R.M.

Mukerji, A. & Lahiri, A. (1960). **Bacterial flora with special reference to the staphylococci of the apparently normal udders of healthy goats and cows collected from slaughter house.** — Indian vet. J. **37**, 557-561. **1320**

Swabs from dissected mammary gland and lactiferous sinus yielded no organisms in 75% and 51%, respectively, of 93 goats and 66% and 46%, respectively, of 24 cows examined. Staphylococci were the preponderant organisms in infected udders and included *Staph. aureus* in a few cases.
—R. N. Mohan.

Melly, M. A., Thomison, J. B. & Rogers, D. E. (1960). **Fate of staphylococci within human leukocytes.** — J. exp. Med. **112**, 1121-1130. [Authors' summary modified.] **1321**

Observation by phase microscopy demonstrated that small numbers of pathogenic staphylococci survived for long periods within living human polymorphonuclear leucocytes, whereas non-pathogenic micro-organisms were rapidly destroyed. Leucocytes in which staphylococci remained viable often appeared less vigorous after ingesting micro-organisms, but intracellular survival could not be consistently correlated with leucocyte damage. Both pathogenic and non-pathogenic cocci divided within living granulocytes during the first few minutes after ingestion. Occasionally pathogenic staphylococci multiplied in dying cells after long periods of intracellular residence. Phagocytosis of more than one pair of staphylococci by a single leucocyte appeared to act as a stimulus to bacterial destruction. Multiple ingestions of pathogenic staphylococci reduced the incidence of survival of the total microbial population within the cell.

Steele, J. H., Zinn, R., Courter, R. & Galton, M. M. (1960). **Bovine mastitis: recommendations for a control program based on preventive medicine.**—Publ. Hlth Rep., Wash. **75**, 970-972. **1322**

Recommendations for the prevention of bovine mastitis comprised: periodic examination of all the cows by a veterinarian, segregation of those with mastitis or milking them after the healthy cows, destruction of mastitis milk, proper use of milking machines, hygienic practices, and good herd management.
—M.G.G.

Moursy, A. W. & Obiger, G. (1960). Zelldifferenzierung als Hilfsmittel für die Diagnose von Sekretionsstörungen und Mastitiden. **[Cell differentiation in the diagnosis of secretory disturbances and mastitis.]** — Milchwissenschaft **15**, 500-506. [Summaries in English, French and Spanish.] **1323**

The diagnostic value in bovine mastitis of the presence of leucocytes with a true polymorphic nucleus, was discussed.—E.G.

Ćosić, D. (1960). **[Flora of healthy and diseased udders.]** — Acta vet., Belgrade **10**,

57-60. [In Serbian. Summary in German.] **1324**

Specific mastitis agents were isolated from 43 of 520 random milk samples from farms around Belgrade. Saprophytes, which under favourable circumstances could become mastitis agents, were isolated from another 44 samples. These included streptococci of groups D, L, N and G, *Micrococcus aurantiacus, M. varians, M. conglomeratus, M. freudenreichii, M. caseolyticus* and *M. candidus*.—E.G.

Hauke, H. (1960). Ein Beitrag zur Epizootologie und Mikrobiologie der infektiösen Schafmastitis. **[Epidemiology and microbiology of infectious mastitis in sheep.]**—Mh. VetMed. **15,** 688-694. **1325**

In 4 flocks, each of about 200 sheep, 292 milk samples were obtained from clinically normal udders and 17 from udders with mastitis. Sixteen of the samples of mastitis milk yielded *Staphylococcus aureus* and one *Pasteurella mastitidis*. Of the samples from normal udders, 4 yielded *Staph. aureus,* 4 *Past. mastitidis,* and 16 saprophytes. The mastitis strains were sensitive to penicillin, streptomycin and most other antibiotics.

—M.G.G.

Zhelev, V., Khristov, S., Gerov, K. & Pavlov, N. (1960). **[Endemic non-purulent meningoencephalitis associated with diplococci in pigs.]**—Izv. Inst. Pat. Zhivotni, Sofia **8,** 65-74. [In Bulgarian. Summaries in German and Russian.] **1326**

Losses from purulent meningoencephalitis on one farm amounted to 119 of 139 affected piglets (out of 2,535 born) in 1957, 91 out of 125 affected piglets in 1958. On another farm 82 of 118 piglets became ill and 22 died. Brain histology was described and illustrated in 8 photomicrographs. An unspecified diplococcus was isolated and the disease was reproduced by inoculating it intraperitoneally into mice and 2 piglets. Treatment with biomycin (chlortetracycline), calcium gluconate and vitamin D gave good results.—R.M.

Ranney, A. F. (1960). **Why tuberculosis in livestock is increasing.**—J. Amer. vet. med. Ass. **137,** 723-724. **1327**

The percentage of cattle reacting to the tuberculin test in the U.S.A. rose from 0·11% in 1954 to 0·23% in 1959. The reasons given for the increase were complacency, interest in other diseases, and, in recent years, increasing care and uniformity in the performance of the tuberculin test, and greater efforts to trace the herds of origin of tuberculous cattle.

—M.G.G.

Kanai, K., Youmans, G. P. & Youmans, A. S. (1960). **Allergenicity of intracellular particles, cell walls, and cytoplasmic fluid from Mycobacterium tuberculosis.** — J. Bact. **80,** 615-621. [Authors' summary modified.] **1328**

Guinca-pigs were injected with viable whole cells of the H37Ra strain, purified mycobacterial cell wall, immunogenic intracellular particles, and water soluble cytoplasmic substances. At intervals they were tested for skin sensitivity to tuberculin and to each of the cellular fractions used for sensitization. Intact cells and the cell wall fraction induced a high degree of tuberculin sensitivity; the immunogenic particles and soluble cytoplasmic materials did not. Delayed systemic fatal allergic reactions after i/p administration of large doses of Old Tuberculin occurred only in g.pigs injected with viable cells or cell walls. All fractions elicited characteristic delayed type reactions of hypersensitivity when small amounts were injected i/d into g.pigs sensitized with viable cells or with cell walls. The allergenicity of the cell walls was not affected by treatment with pepsin, trypsin, or ribonuclease. But treatment of the cell walls with alkaline ethanol at 37°C. destroyed the capacity to produce tuberculin hypersensitivity, presumably by extracting lipoprotein moiety.

Freerksen, E. & Lauterbach, D. (1960). I. Zur Diagnostik der Rindertuberkulose mit unterschiedlichen Tuberkulindosen (500 TE und 5000 TE). II. Gegenseitige Beeinflussung von zwei gleichzeitig gesetzten Tuberkulin-Injektionen. III. Über die Auslösbarkeit von Tuberkulin-Reaktionen nach Verfütterung atypischer Mycobakterienstämme beim Rinde. **[I. Diagnosis of bovine tuberculosis with two different doses of tuberculin. II. Mutual influence of two simultaneous tuberculin injections. III. Tuberculin reactions after feeding atypical mycobacteria to calves.]** — Zbl. Bakt. I. (Orig.) **180,** 205-211; 212-216 & 217-220. [Summaries in English, French, Spanish and Russian.] **1329**

The skin reactions of tuberculous cattle and non-specific reactors in different herds to i/d injection of 500 units of tuberculin were about 1–3 mm. smaller than those to 5,000

units. It was concluded that injecting 500 units merely causes a weaker reaction and does not distinguish non-specific reactors.

Tuberculous cattle were inoculated simultaneously with 2 different mammalian tuberculins, or with 2 doses of the same mammalian tuberculin, or with one mammalian and one avian tuberculin. The reactions had no influence on each other.

Six of 7 atypical mycobacteria that were fed to calves caused positive or doubtful reactions to mammalian tuberculin.—M.G.G.

Kress, F., Mathois, H. & Stöckl, W. (1960). Untersuchungen über die Reaktionsstärke von verdünntem albumosefreiem Standard-tuberkulin am Rind. **[Reaction to diluted tuberculin in cattle.]**—Wien. tierärztl. Mschr. **47,** 500-509. [Summaries in English, French and Italian.] **1330**

Cattle in 2 herds were inoculated simultaneously with different dilutions of tuberculin ranging from 50,000 units per ml. (HCSM tuberculin) to 50 units per ml. The dose of each tuberculin was 0·1 ml. Although the diluted tuberculins caused progressively smaller reactions, 51 cattle positive to standard tuberculin were also positive to tuberculin containing 500 units per ml., while 13 cattle giving non-specific reactions to standard tuberculin were negative to tuberculin containing 500 units per ml. Two of these non-specific reactors were slaughtered; histological examination did not reveal TB. It was suggested that non-specific reactors could be detected by simultaneous inoculation of standard tuberculin and its hundredfold dilution.—M.G.G.

Vuillaume, R. (1960). Standardisation des tuberculines et des méthodes de tuberculination. **[Standardization of tuberculins and of the tuberculin test in France.]**—Rec. Méd. vét. **136,** 1157-1164. [Summaries in English and Spanish.] **1331**

In France the tuberculin test consists of a single i/d injection in the side of the neck of 0·1–0·2 ml. of tuberculin containing 100,000 units per ml. The tuberculin is prepared from 3 human and 3 bovine strains of tubercle bacilli grown on Sauton's medium. The preparation of HCSM tuberculin and the interpretation of the reactions were described.
—M.G.G.

Stewart, C. J., Embleton, D. P. F. & van Zwanenberg, D. F. (1961). **Comparative tuberculin-testing of human subjects. A method of differentiating the type of virulent mycobacterial infection.** — Brit. med. J. January 7th, 7-13. [Authors' summary modified.] **1332**

The results of tuberculin-testing 8,839 schoolchildren simultaneously with bovine and human PPD (Weybridge tuberculins), using the Heaf multiple-puncture technique, in seven districts is reported. In two districts known to have had a supply of milk infected with tubercle bacilli and in which there has since been a high incidence of non-respiratory tuberculosis more reactors to bovine PPD have been found than to human PPD, and the reactions to bovine are larger than those to human PPD. In two towns with a known clean milk supply and a low incidence of non-respiratory tuberculosis there are more reactors to human PPD, and these reactions are the larger. This evidence suggests that comparative tuberculin-testing of human subjects with the bovine and the human PPD used in this investigation may differentiate human and bovine sources of mycobacterial infections. It has also been shown that there is a qualitative difference between these two PPD preparations as well as a quantitative difference.

Lambert, H. P. (1960). **The influence of chemoprophylaxis on immunity in experimental tuberculosis.** — Amer. Rev. respir. Dis. **82,** 619-626. [Summaries in French and Spanish. Abst. from author's summary.] **1333**

Administration of isoniazid for various periods starting 8 weeks after primary infection did not adversely affect immunity. Tubercle bacilli isolated from the spleen of treated mice were all fully susceptible to isoniazid.

Martin, J. (1960). Zum Problem der sog. Periarteriitis nodosa bei den Haustieren. **[The problem of periarteritis nodosa in domestic animals.]**—Berl. Münch. tierärztl. Wschr. **73,** 404-409. [Summary in English.] **1334**

A ewe aged 2½ years was infected conjunctivally with tubercle bacilli and was killed a year later. Apart from calcified pulmonary TB., there was periarteritis nodosa, particularly in kidneys and heart, and also in the brain. Lesions more accurately described as arteritis nodosa were found in a bovine animal: no details of illness are given and only heart and skeletal muscle were examined. There are 5 photomicrographs from the first case and 2 from the second.—R.M.

Žák, F. & Šula, L. (1960). **Experimental studies on the morphology of vole bacillus infection in cattle, with a contribution to the development of so-called Schaumann bodies.** — Path. Microbiol., Basel **23**, 456-471. [In English. Summaries in French and German.] **1335**

This deals with strain MP of the murine type bacillus developed by Šula and his colleagues for use as a vaccine (M vaccine). Sixty cattle were inoculated with twice the prophylactic dose of organisms and were killed for pathological examination between 7 days and 3 years afterwards. The strain caused a notable leucocytic reaction which persisted in the form of minute abscesses around agglomerations of bacilli for over 2 years in two cases. There was also marked proliferation of typical epithelioid granulation tissue, and calcification within cells as well as of caseous necrotic lesions.—R.M.

Klimeš, B. & Celer, V. (1960). Krevní obraz při tuberkulóze drůbeže. **[The blood picture in fowls with tuberculosis.]** — Sborn. čes. Akad. zemědělsk. Věd, vet. Med. **5**, 765-774. [In Czech. Summaries in English, German and Russian.] **1336**

Characteristic changes in the blood picture of 25 hens aged 2–3 years from an infected flock which had yielded positive tuberculin reactions were: reduction in the number of erythrocytes to 2,562,000 from 2,933,000 in healthy fowls, and the average haemoglobin value to 10·5 g.%, as compared with 11·2 g.%. The number of leucocytes was twice that of normal fowls. There was lymphopenia and an increase in the number of heterophile leucocytes. In advanced stages of the infection, the ratio between lymphocytes and heterophile leucocytes was the inverse of that in healthy fowls. The number of granulocytes was increased by up to 75%. Results obtained in hens infected experimentally by the s/c, i/p and oral routes respectively, were similar. —E.G.

Orlov, A. I. (1961). **[Saline flotation method of concentrating Mycobacterium johnei in samples of faeces or tissues.]**—Veterinariya, Moscow No. 1 pp. 78-80. [In Russian.] **1337**

Two to three grammes of faeces or chopped-up lymph node or intestine were placed in a 20 ml. test tube and mixed with 13–15 ml. phenolized normal saline. The tube was allowed to stand at room temp. for at least an hour, preferably 12–24 hours. Fluid from the centre of the meniscus was transferred to a microscope slide, which was then fixed and stained by the usual method.

The results of direct smears and flotation smears from the same materials are shown in a table. For example, of samples of lymph node and intestine from cases proven at slaughter, 76 of 90 were positive in direct smears and 15 of 15 were positive in flotation smears. With material from living animals that reacted to avian tuberculin, 54 of 70 samples were positive by the direct method, 41 of 42 by the flotation method.—R.M.

Rankin, J. D. (1961). **The experimental infection of cattle with Mycobacterium johnei. II. Adult cattle, inoculated intravenously. III. Calves maintained in an infectious environment.** — J. comp. Path. **71**, 6-9 & 10-15. [Author's conclusions modified.] **1338**

I. None of five cows inoculated i/v when 3 years old with *M. johnei* developed clinical Johne's disease within 4 years. Microscopic lesions of Johne's disease were found in the intestine of one of the cows at P.M. examination. *M. johnei* was recovered culturally from the lymphatic system of all five cows 4 years after inoculation. The question of a resistance which is apparently associated with age is discussed.

II. Six of nine cows which had been continuously exposed since calfhood to an environment naturally contaminated with *M. johnei* developed Johne's disease. Two of the six cows were six months old when first introduced to the infected environment. When the cows were killed at up to 4½ years after exposure, *M. johnei* was cultivated from all nine, usually from a wide variety of sites. In the cows which became clinical cases, milk yield was low in the lactation prior to the appearance of the disease.

Exposure to a deliberately created infectious environment appears to be a useful experimental procedure until a more reliable and acceptable method of experimental infection becomes available.

Pascoe, R. R. (1960). **A case of bovine mastitis caused by Corynebacterium pyogenes.** — Aust. vet. J. **36**, 410-411. [Author's summary modified.] **1339**

A cow showing hypocalcaemia died in 20 hours from septicaemic *C. pyogenes* infection originating from the udder; *Pseudomonas pyocyanea* septicaemia was also present. P.M. examination confirmed the diagnosis of mastitis and revealed also enlargement of the spleen, and kidney and liver damage. *Ps.*

pyocyanea was recovered from kidneys, spleen and liver and *C. pyogenes* from milk, kidneys and spleen.

Holt, H. D. & Goffe, A. P. (1961). **A corynebacterium isolated from skin lesions in monkeys.**—Mon. Bull. Minist. Hlth Lab. Serv. **20**, 17. **1340**

Among a consignment of monkeys, ulcers were found on many of them on the back of the head, over the dorsal surface of the arms and particularly over the elbows. Although they were at first assumed to be injuries, swabs were taken and an organism similar to *Corynebacterium ovis* was isolated.

On inoculation subcutaneously into guinea-pigs abscesses formed at the site of injection, but there was no toxaemia and no animals died. Diphtheria antitoxin given s/c or i/p had no effect on the local abscess formation.

A number of monkeys died and crater-like lesions undermining the skin were found which were similar to those produced in g.pigs.

Very large doses of streptomycin appeared to be effective in the remaining monkeys and the lesions were not met with in later batches. —R.M.

Wawrzkiewicz, K. (1960). Badania nad postacia "X" włoskowca różycy świń. **[Investigation of Erysipelothrix rhusiopathiae Type X.]**—Ann. Univ. M. Curie-Skłodowska Sect. DD **13**, 215-226. [In Polish. Summaries in English and Russian.] **1341**

The form X of *E. rhusiopathiae* described by the author in 1958 [*Acta microbiol. polon.* **7**, 105] was isolated from two further strains. There were no differences in the antigenic structure of forms S, R, and X of *E. rhusiopathiae*. By using monovalent serum it was possible to identify serotypes of swine erysipelas by the gel diffusion precipitin test, which also revealed that in all 3 forms of *E. rhusiopathiae* (S, R, and X) there are only two precipitating components.—M. Gitter.

Sikes, D. (1960). **New concepts of arthritis in swine.**—Canad. J. comp. Med. **24**, 347-351. [Author's summary modified.] **1342**

S. discussed pyogenic and non-pyogenic infections in relation to arthritis in pigs. He described the symptoms, pathology and course of experimental arthritis due to *Erysipelothrix rhusiopathiae* infection. He compared rheumatoid arthritis in man and a rheumatoid-like arthritis due to *E. rhusiopathiae* infection in pigs.

Lucas, A., Chauvrat, J. & Laroche, M. (1960). Infection du lièvre à Erysipelothrix rhusiopathiae, bacille du rouget du porc. **[Erysipelothrix rhusiopathiae infection in a hare.]** — Rec. Méd. vét. **136**, 1207-1208. [Summaries in English and Spanish.] **1343**

E. rhusiopathiae was isolated from a hare found dead with acute bilateral haemorrhagic orchitis. Genital trauma was considered to be the route of entry of the organism.—M.G.G.

Jentzsch, K. D. (1960). Untersuchungen von Hundeblut auf Listerien-Agglutinine. **[Examination of dog blood for listeria agglutinins.]** — Zbl. VetMed. **7**, 769-778. [Summaries in English, French and Spanish.] **1344**

Blood serum from 100 dogs was tested with freeze-dried OI, II antigen of listeria serotype 1. Agglutination titres of up to 1 : 160 were considered normal, and 9 sera with titres of 1 : 320 or over were held to be doubtful or positive. In a few cases high titres were associated with syndromes possibly due to listeria infection. High titres were not connected with age, sex, or breed. The normal blood titre of dogs for OV antigen of serotype 4 could not be determined, as most sera were negative and none had a titre exceeding 1 : 20. —M.G.G.

Lehnert, C. (1960). Die Tenazität von Listeria monocytogenes in der Aussenwelt. **[Survival of Listeria monocytogenes outside the host.]** —Zbl. Bakt. I. (Orig.) **180**, 350-356. [Summaries in English, French, Spanish and Russian.] **1345**

L. monocytogenes survived in damp soil for up to 11½ months, in damp faeces for up to 16½ months, on dry straw for 207 days, and in dry soil and dry faeces for over 2 years. It resisted a temp. of – 20°C. for over 2 years, during which it was thawed and re-frozen 35 times. No decline in virulence for mice was found.—M.G.G.

Gray, M. L. (1960). **Isolation of Listeria monocytogenes from oat silage.**—Science **132**, 1767-1768. [Author's summary modified.] **1346**

A culture of *Listeria monocytogenes* isolated from the brain of a sheep from a flock fed contaminated silage and cultures isolated from this silage were all serological type 4b, establishing a definite epidemiological relationship.

Bukulov, I. A. (1959). **[I. Epidemiological features of listeria infection in animals. II. Chlortetracycline therapy in listeria infection.]** — Trud. Mosk. Vet. Akad. **25,** 158-164 & 165-174. [In Russian. Summary in English.] **1347**

Observations made in the Moscow oblast between 1947 and 1958 were summarized. Listeria infection was recorded in all farm animals, although commonest in pigs. It occurred most often in spring and in autumn. Laboratory and field trials of biomycin (chlortetracycline) showed that it cured about half the sheep with nervous symptoms.—R.M.

Pascoe, R. R. (1960). **An outbreak of bovine mastitis due to Pasteurella spp.**—Aust. vet. J. **36,** 408-410. [Author's summary modified.] **1348**

In a herd of 39 cows seven were affected in one or more quarters. The disease was characterized by chronic recurrence, the production of thin whey, ropy clots and swollen hot quarters.

Treatment with penicillin was of little value; oxytetracycline gave apparent clinical recoveries over short periods. Bacteriological cures were not obtained.

Sandstedt, H. (1960). Några orienterande försök över tarmkolitoxiners betydelse för uppkomsten av paresliknande sjukdom hos ko. **[The role of E. coli toxin in paresis-like disease in cows. Preliminary experiments.]**—Medlemsbl. Sverig. VetFörb. **12,** 425-427. [In Swedish.] **1349**

While the incidence of milk fever seems to be declining, cases with symptoms indicative of liver and muscle damage are becoming commoner. To examine the possible role of digestive disturbances due to an abnormal bacterial flora of the small intestine, sulphonamide treatment was added to the prophylactic measures already being tried (high carbohydrate, low protein diet during the last weeks of the dry period, and very careful milking during the first days after calving). Insoluble combinations of sulphonamides were given shortly before parturition, usually preceded by easily soluble combinations in quite large doses two days in succession. Of 62 of the treated cows which could be followed up, 41 developed no symptoms and 10 others which also received simultaneously a vitamin D concentrate calved normally. Of the 11 which developed paresis, 7 had less severe symptoms than previously and 4 were severely ill. In a number of cases in which the owners did not arrange for prophylactic treatment at the next calving, the cows again developed paresis. In 14 cows with paresis the numbers of coli bacteria in the small intestine were generally higher than in 8 cows which calved normally. *E. coli* was isolated in pure culture from the hyperaemic area of the small intestine of a fatal case of puerperal paresis. Toxin from strains of *E. coli* of similar origin was injected i/v into 3 cows — one non-pregnant and two that had calved normally 2 days previously (the one prone to paresis, the other a 12-year-old that had never been affected). The first two became severely ill, the first with a condition resembling hepatitis without prostration, the other with prostration after 18 hours and falling blood values of calcium and magnesium. The third cow developed similar but much milder symptoms.—F.E.W.

Geurden, L. M. G., Vanderplassche, M., Devos, A., Van den Wijngaert, M. & Snoeck, G. (1960). Bacteriologisch en immunologisch onderzoek bij puerperale sepsis van zeugen. **[Bacteriological and immunological studies on puerperal sepsis in sows.]**—Vlaams diergeneesk. Tijdschr. **29,** 303-312. [In Flemish. Summaries in English, French and German.] **1350**

The main features of puerperal sepsis associated with several serotypes of *E. coli* have been described before [*V.B.* **29,** 3722]. In spontaneous and experimental cases and in normal sows, the authors compared changes during 28 days after parturition in alpha and gamma serum proteins; *E. coli* agglutination tests and haemagglutination tests on serum; also histological examination of udder biopsy samples and bacteriological examination of uterus, udder and blood. It was concluded that sepsis was provoked by infection, mainly by *E. coli,* developing soon after farrowing, possibly by organisms of intestinal origin. Maximum titres of *E. coli* agglutinins were found 7–8 days after farrowing.—R.M.

I. Wiznitzer, T., Better, N., Rachlin, W., Atkins, N., Frank, E. D. & Fine, J. (1960). **In vivo detoxification of endotoxin by the reticulo-endothelial system.** — J. exp. Med. **112,** 1157-1166. **1351**

II. Wiznitzer, T., Schweinburg, F. B., Atkins, N. & Fine, J. (1960). **On the relation of the size of the intraintestinal pool of endotoxin to the development of irreversibility in hemorrhagic shock.** — Ibid. 1167-1171. [Authors' summaries modified.] **1352**

I. The normal r.e.s. extracts endotoxin from the circulation and inactivates it very rapidly. When the r.e.s. has been damaged, whether by a blockading agent, such as thorotrast, or by a reversible degree of haemorrhagic shock, it can extract only a small proportion of the endotoxin, and very little of that extracted, is detoxicated. An organ like the kidney, which does not contain a significant amount of reticulo-endothelial tissue, extracts only an insignificant percentage of the injected amount, and therefore does not detoxicate endotoxin. Dephosphorylation is probably an indirect index of detoxication. Plasma alone did not inactivate endotoxin.

II. That coliform-free rabbits tolerate exposure to a degree and duration of haemorrhagic shock which is lethal for rabbits which have the normal flora, and that these tolerant rabbits lose their tolerance when *E. coli* organisms are introduced into the gut several hours before inducing shock, demonstrate the critical importance of the size of the pool of endotoxin. In several series of coliform-free rabbits fed *E. coli* by gavage, the more firmly *E. coli* was re-established in the flora, the lower was the survival rate of the rabbits. The presence of the usual number of coliform bacteria in the intestinal flora does not mean the presence of the usual amount of endotoxin in these bacteria. The amount of endotoxin depends not only on the size of the population, but also on ecological factors which govern the amount of endotoxin elaborated by any given strain or strains of coliform bacteria.

Winter, A. J., Simon, J., McNutt, S. H. & Casida, L. E. (1960). **The effect of an induced state of leukopenia on the uterine bactericidal activity in rabbits.** — Amer. J. vet. Res. **21**, 664-667. **1353**

Following experimental infection with *Escherichia coli,* the overall bacterial recoveries 4 hours after infection were significantly higher from the uterine horns of leucopenic rabbits in both the follicular and luteal ovarian phases than from corresponding horns of normal rabbits in the two states. Bactericidal activity in the uteri was greater in the follicular phase than the luteal in both leucopenic and normal rabbits suggesting that a non-cellular bactericidal factor may be active in the uterus of oestrous rabbits.

—A. Ackroyd.

Winter, A. J., Broome, A. W., McNutt, S. H. & Casida, L. E. (1960). **Variations in uterine response to experimental infection due to the hormonal state of the ovaries. I. The role of cervical drainage, leukocyte numbers, and noncellular factors in uterine bactericidal activity.** — Amer. J. vet. Res. **21**, 668-674. **1354**

Broome, A. W., Winter, A. J., McNutt, S. H. & Casida, L. E. (1960). **Variations in uterine response to experimental infection due to the hormonal state of the ovaries. II. The mobilization of leukocytes and their importance in uterine bactericidal activity.** — Ibid. 675-682. **1355**

In experimental infection of the ligated uterus with *Escherichia coli* or *Staphylococcus aureus* more bacteria survived in the uteri of rabbits in the luteal ovarian phase than in the follicular phase. More bacteria were lost in the follicular phase through cervical drainage from the uterus. The number of bacteria surviving was related linearly to the number of leucocytes in the uterine lumen in animals in the luteal phase but not in the follicular phase. No over-all difference due to the hormonal state existed in the amount of bactericidal activity exhibited by cell-free uterine exudates *in vitro.* Differences in bactericidal action of uteri in the two hormonal states were not due to differences in the level of leucocytes circulating in the blood nor to differences in the number of neutrophiles normally present in the uteri in the different reproductive phases. Uteri in the follicular phase were able to attract neutrophiles faster whilst once mobilized they had more difficulty in passing through the endometrium in the luteal phase. Phagocytic activity of the leucocytes was the same in both phases.

—A. Ackroyd.

Hawk, H. W., Turner, G. D. & Sykes, J. F. (1960). **I. The bactericidal properties of uteri and uterine exudates of rabbits with reduced leukocytic activity. II. Noncellular bactericidal factors in inflammatory exudates from the uterine and pleural cavities of estrous and pseudopregnant rabbits.**—Amer. J. vet. Res. **21**, 649-656 & 657-663. **1356**

I. Although Winter *et al.* have reported that the differential bactericidal activity of uteri of oestrous and pseudo-pregnant rabbits is maintained in leucopenic rabbits, the present authors using only slightly different procedures, found that in neither state did the uteri of rabbits possess an effective defence against *Escherichia coli* after the leucocytic response had been inhibited experimentally.

Little evidence was found that bactericidal factors independent of those associated with leucocytic influx were present in the uterine exudates of leucopenic oestrous rabbits.

II. The non-cellular bactericidal thermostable substances present in inflammatory uterine exudates of oestrous rabbits were also present in inflammatory exudates of the uteri of pseudo-pregnant rabbits and of the pleural cavities of both oestrous and pseudo-pregnant rabbits. *In vitro,* the bactericidal activity of cell-free uterine exudates was proportional to the number of leucocytes in the uterine lumen regardless of the endocrine state of the rabbit. Ovarian hormones apparently affected the concentration of non-cellular bactericidal substances by influencing the rate of leucocytic response, its development being more rapid in the ovarian follicular than in the luteal phase. The bactericidal activity of pleural cavity exudates did not appear to be influenced by the endocrine state of the rabbit.

—A. Ackroyd.

Davis, M. S. & Bateman, J. B. (1960). **Relative humidity and the killing of bacteria. I. Observations on Escherichia coli and Micrococcus lysodeikticus.** — J. Bact. **80,** 577-579. [Authors' summary modified.] **1357**

Water vapour is lethal to freeze-dried washed *E. coli* held in a vacuum; the rate of killing at 93% relative humidity is considerably greater than at lower r.h. This property *E. coli* has in common with *Serratia marcescens,* although to a smaller degree, whereas *Micrococcus lysodeikticus* under the same experimental conditions is many times more stable and was not selectively killed at 93% r.h.

Turner, E. (1959). **A biochemical study of 141 strains of Enterobacteriaceae isolated from tissues and fluids of animal origin.**—Qd J. agric. Sci. **16,** 419-429. **1358**

Cowan's scheme for grouping strains of Enterobacteriaceae was applied to 141 strains isolated from a variety of animal tissues and body fluids. Special attention was given to strains in samples of milk from cases of bovine mastitis, to strains that preliminary tests suggested were salmonella but did not agglutinate Salmonella group B, C, D or E antisera, and to strains suspected to be species of *Klebsiella.* The strains were grouped as Salmonella 15, Arizona 2, *Escherichia coli* 19, Alkalescens-Dispar 8, *Escherichia freundii* 2, Bethesda-ballerup 13, *Klebsiella ozaenae* 3, *Klebsiella pneumoniae* 19, *Klebsiella* sp. 12, Cloaca 27, Providence 2, and ungrouped 19. The need for further work on the pathogenicity of lesser known strains of Enterobacteriaceae is stressed.—A. Culey.

Biancardi, G. (1960). Infezione spontanea da Shigella equirulis nel coniglio. **[An outbreak of Bacterium viscosum equi infection in rabbits.]**—Vet. ital. **11,** 464-472. [Summaries in English, French and German.] **1359**

Examination of one of 4 rabbits that died without previous symptoms revealed punctiform haemorrhages in the peritoneum, haemorrhagic infarcts in the lungs, enlarged spleen and subserous haemorrhages in the intestines. Heart blood, liver and spleen yielded *Bact. viscosum equi* in culture. Results of pathogenicity and other tests are given.—T.E.G.R.

Nyström, G. (1960). **Sensitivity of Salmonella bacteria in vitro to different antibiotics and chemotherapeutics.** — Acta path. microbiol. scand. **50,** 303-321. [In English.] **1360**

Using an agar diffusion technique, N. compared the action of 12 antibiotics, sulphadimidine, and nitrofurantoin on 322 salmonella strains, representing 109 serotypes and 35 serogroups. Chloramphenicol was the most effective, followed by streptomycin, sulphadimidine, neomycin, polymyxin, nitrofurantoin, oxytetracycline, tetracycline, chlortetracycline, penicillin, erythromycin, novobiocin, oleandomycin and bacitracin. Resistance was not related to antigenic structure. In 20 strains of the *S. gallinarum-pullorum* serotype, the order of diminishing activity of the agents was different, the 3 most effective being chloramphenicol, neomycin, and chlortetracycline. There was no essential difference in sensitivity of 43 strains of *S. typhi-murium* of 17 phage types.—M.G.G.

Schulte, F. & Scholz, H. D. (1960). Ein Beitrag zur Salmonellose der Tauben. **[Salmonellosis in pigeons.]**—Mh. Tierheilk. **12,** 291-300. **1361**

From 1954 to 1959, salmonella was isolated from 300 of 707 carcasses and organs of pigeons and 1,545 of 11,010 samples of pigeon faeces sent for examination from most parts of the German Federal Republic, also from one sample of pigeon food, but not from the eggs, blood and joint fluid of pigeons. P.M. and histological findings were described. Of the 1,846 strains, 1,838 were *S. typhimurium,* 4 *S. montevideo,* 3 *S. dublin,* and one was *S. senftenberg.*—M.G.G.

Tello G., A. & Colichon Y., H. (1958-59). Paratifosis en gallina ocasionada por Salmonella harrisonburg. **[Salmonella harrisonburg infection in hens.]** — Rev. Fac. Med. vet., Lima **13-14**, 86-88. [Summary in English.] **1362**

P.M. examination of a hen from a flock of 100 (of which 10 died) revealed congested, enlarged liver with small necrotic foci; enlarged spleen, congestion of the lungs, pericarditis and catarrhal enteritis; the liver yielded *Salmonella harrisonburg* in culture.
—T.E.G.R.

Suganuma, Y. (1960). **[Histopathology of serositis in pullorum disease.]**—Jap. J. vet. Sci. **22**, 175-179. [In Japanese. Summary in English.] **1363**

From examination of 459 cases, S. found that the most characteristic lesion of pullorum disease was inflammation of the serous membranes of heart, pleuro-peritoneum, intestine and mesentery. There are 12 photomicrographs.—R.M.

el Nasri, M. (1960). **Brucellosis in the Southern Sudan.** — Vet. Rec. **72**, 1200 & 1201. [Author's summary modified.] **1364**

In the Upper Nile Province in Southern Sudan bovine brucellosis exists in all districts and the percentage of positive reactors is high.

The husbandry methods and other factors which appear to favour the spread of infection are discussed.

Kerr, W. R. (1960). **Brucellosis.**—Irish vet. J. **14**, 164-175. Discussion: pp. 184-194. **1365**

The Northern Ireland scheme for the eradication of bovine brucellosis was described [see also *V.B.* **31**, 644]. In 75% of infected herds there was no evidence of clinical abortions. It was suggested that field strains that live for years in cows partially protected by Strain 19 may decline in virulence.
—M.G.G.

Korotich, A. S., Slesarenko, V. V., Isaenko, L. V. & Shcherbak, Y. N. (1960). **[Survey of the control of brucellosis and the prospects for eradication in the Ukraine.]**—J. Microbiol., Moscow No. 12 pp. 104-107. [In Russian.] **1366**

It was estimated that 70% of human infections were acquired from sheep and goats, 29% from cattle and 0·6% from pigs. During 1957–58 fifty-six cases were attributed to *Br. melitensis* in cows' milk, the cows having been infected by sheep or goats. The incidence of brucellosis in cattle, sheep and goats had been greatly reduced during the past ten years and the number of persons infected in 1959 was 8% of the number infected in 1952. During 1956, 160,000 persons (mainly farm workers) were immunized. Brucellosis among sheep and goats might be eradicated by 1962 and bovine brucellosis would be further reduced.
—R.M.

Fritzsche, K. & Kohl, D. (1960). Der Wert des schnellen Coombs-Testes (Rapid-Antiglobuline-Test = RAgT) bei der Diagnostik der Rinderbrucellose. I & II. **[Rapid antiglobulin test for diagnosis of bovine brucellosis. Parts I & II.]** — Rindertuberk. u. Brucellose **9**, 135-141 & 149-161. **1367**

Of 6,329 sera from cattle negative to the slow agglutination test for brucellosis, 6·6% were positive to the rapid antiglobulin test [see *V.B.* **29**, 2012]. Of 1,776 sera with doubtful agglutination titres (1 : 20 or 1 : 40), 18·1% were positive to the antiglobulin test, and only 4·7% to the c.f. or Meinicke test. Of 1,088 sera with positive agglutination titres, 76·7% were positive to the antiglobulin test, and 57·9% to the c.f. test or Meinicke test. Repeated tests in different herds revealed that freshly infected cattle became positive to the antiglobulin test weeks or months before becoming positive to the other 3 tests. It was concluded that herds could be freed from brucellosis more quickly with the use of this test. Its use was not recommended in immunized herds.—M.G.G.

Bürki, F. (1960). Zur Beurteilung von Einzel-Blutreagenten in agglutinatorisch negativen Beständen bei der Sanierung auf Rinderabortus Bang. **[Evaluation by the complement-fixation test of isolated agglutination test reactors, in otherwise brucellosis-free herds.]** —Schweiz. Arch. Tierheilk. **102**, 595-599. [Summaries in English, French and Italian.] **1368**

The sole positive reactor to the slow serum agglutination test in each of 223 herds of cattle was submitted to the c.f. test: 181 were negative, 9 doubtful, and 33 positive.
—M.G.G.

Robertson, L. (1961). **Brucella organisms in milk.**—Roy. Soc. Hlth J. **81**, 46-48. **1369**

In North Lancashire during 1959 milk samples from 842 herds were examined and there was evidence of brucella in milk from 158 of the herds (18·7%). The percentage of herds infected in different districts varied from 9 to 31. Of the 191 strains isolated, 16 were

Br. melitensis, 101 were *Br. abortus,* 26 were aerobic strains of *Br. abortus,* 4 shared the properties of *abortus* and *melitensis* and 6 were dye-sensitive *abortus* strains. It appeared that 16 of the 842 herds were infected with *melitensis.*

Whereas in the towns most of the milk was pasteurized, in some rural districts of Lancashire, much visited by holiday-makers, only between 3 and 50% was pasteurized. The risk of human infection was discussed.—R.M.

Lerche, M., Entel, H. J. & Mossdorf, R. (1960). Die Widerstandskraft von Brucella-Bakterien gegenüber Kochsalz und Nitritpökelsalz sowie ihr Verhalten bei der Pökelung infizierten Fleisches. **[Resistance of brucella bacteria to saline and nitrite pickling and their behaviour in pickled meat.]**—Arch. Lebensmittelhyg. **11,** 271-276. **1370**

Ten strains of *Br. abortus, melitensis* or *suis* were tested for their resistance to 1–4% sodium chloride and 1–3·5% of "nitrite pickling salt" in broth or solid media. The results are shown in tables. In addition, 3 g.pigs and 2 rabbits were inoculated into the heart with brucella and killed an hour later. The bled carcasses were placed in 25% nitrite pickling soln. and held at 4° or 8°C. for up to 104 days. Also, two shoulders of bacon were inoculated with *Br. abortus* and the fate of the bacteria was followed during pickling and smoking. In general, the bacteria survived between 4 and 11 weeks in pickled meat, longer at lower temperatures than at higher. —R.M.

Diernhofer, K. (1961). Versuche zur medikamentellen Vorbeuge der Rinderbrucellose. **[Prevention of brucellosis in cattle with Pecudin.]**—Dtsch. tierärztl. Wschr. **68,** 65-70. [Summary in English.] **1371**

Nine pregnant cattle were given by mouth 5 g. daily of Pecudin until calving. Within 11–47 days after treatment began, they were infected by various routes with *Br. abortus.* None aborted. Excretion of brucella in the placenta or milk was demonstrated in both animals infected i/v, in one of 2 infected conjunctivally, but in none of the 5 infected by the intradermal route, which is more akin to natural infection. Of 6 pregnant cattle infected experimentally with *Br. abortus* and left untreated, one aborted and all excreted brucella in the placenta or milk. The daily dose of 5 g. was accepted, but one of 10 g. was refused after a few weeks, and 20 g. daily caused haemoglobinuria, anorexia and death. In field trials brucellosis was eradicated from 3 herds of cattle with the help of Pecudin; in 2 other herds the treatment failed as the owners gave the drug only at irregular intervals.—M.G.G.

Yoshida, N., Fukui, K., Tani, A. & Fukui, R. (1959). **Studies on the bacterial cell wall. XV. Studies on the cell wall vaccine of Brucella abortus Bang.** — Tokushima J. exp. Med. **6,** 167-178. **1372**

Strain 554 was used in the preparation of: normal bacterial suspension, standardized at $0{\cdot}3 \times 10^{10}$ cells/ml.; cell-wall vaccine, containing approximately the same number of cells; cytoplasmic vaccine, containing the corresponding amount of bacterial cytoplasm. The cell wall and cytoplasmic fractions were obtained by disintegration and separation of the whole cell suspension. Agglutinin titres in mice immunized with whole-cell vaccine increased more rapidly and were higher than those in mice immunized with either of the other two vaccines. The whole-cell and the cytoplasmic vaccines were highly toxic for mice (indicating that the cytoplasm contained the toxin) and the cell wall vaccine was comparatively non-toxic. The cell wall and the whole-cell vaccines had equal preventive properties and were superior, in this respect, to the cytoplasmic vaccine. Challenge caused a rapid decrease in body weight (which was not made up at all) in mice immunized with cytoplasmic vaccine while it hardly affected that of mice immunized with either of the other two. Spleen and liver weight and size, and number and size of granulomas were greater in mice immunized with cell wall or whole-cell vaccine than in those treated with cytoplasm only. Results obtained with the cell wall vaccine are considered promising.—T.E.G.R.

Ostrovskaya, N. N. & Solov'ev, N. N. (1960). **[Electron microscopy of phage lysis of brucella.]**—J. Microbiol., Moscow No. 11 pp. 4-10. [In Russian. Summary in English.] **1373**

Action of the bacteriophage "TB" (isolated from sewage at Tbilisi) on *Br. abortus* Strain 19-BA and Strain 104-M was studied.—R.M.

Reusse, U. (1960). Untersuchungen über die Leistungsfähigkeit der Nyiredy'schen Katalaseprobe für die Typendifferenzierung von Brucellen. **[Suitability of the catalase test described by Nyiredy for typing brucella.]**—Rindertuberk. u. Brucellose **9,** 125-128. **1374**

In repeated tests 9 strains of *Br. suis*

formed much more catalase in peroxide soln. than 10 strains of *Br. abortus* and 6 of *Br. melitensis* [see also *V.B.* **25,** 3955].—M.G.G.

Chodkowski, A., Ugorski, L. & Kowalski, S. (1960). Przypadek brucelozy u owiec. **[Brucella infection in sheep in Poland.]** — Med. Wet., Warszawa **16,** 533-534. [In Polish. Summaries in English and Russian.] **1375**

In a flock in which 32 out of 92 ewes had aborted, *Brucella abortus* was isolated from one foetus and *Br. melitensis* from another. This is the first recorded isolation of any brucella species from sheep in Poland.

—M. GITTER.

Bogdan, J. (1960). Brucelózne granulómy oviec a laboratórnych zvierat vo vztahu k diagnostike. **[Brucella granulomata in sheep and laboratory animals in relation to diagnosis.]**—Sborn. čes. Akad. zemědělsk. Věd, vet. Med. **5,** 863-870. [In Slovak. Summaries in German and Russian.] **1376**

Granulomata were produced in 35 ewes, 131 rams, 24 rabbits, 74 g.pigs, 20 rats and 20 mice by parenteral infection with *Brucella suis, Br. abortus* and strains isolated from rams with epididymitis. The infective dose for mice was 0·2 ml., for sheep 2·5 ml. of bacterial suspension. Common sites of granuloma were liver, lungs, spleen, intestine and peritoneum, but they were also found in testicles, epididymides and uterus of sheep and laboratory animals. In granulomata of the reticulo-endothelial system, there was perivascular infiltration, and in later stages fibrosis. The diagnostic value of histological findings was discussed.—E.G.

Dumonteil, C. (1959). I. Avortement enzootique des brebis à étiologie microbienne complexe. II. Recherches sur la présence d'anticorps brucelliques et vis-à-vis de "Rickettsia burneti" chez les étudiants vétérinaires. **[I. Abortion of complex aetiology in ewes. II. Antibodies against brucella and Q fever in sera from veterinary students.]** —Thesis, Paris (Alfort) pp. 55. **1377**

Serological examination of a flock of 150 ewes troubled with abortion revealed antibodies to brucella, Q fever and *Salmonella abortus-ovis.*

Agglutination tests for *Br. abortus* on sera from veterinary students during two successive years revealed titres of 1 : 40 and above in 11 of 74 first-year students, 17 of 93 second-year, 25 of 60 third-year and 33 of 53 fourth-year students. It appeared that the incidence of positive tests increased from 14–16% in first-year students to 52–88% in the fourth year. Of seven with clinical symptoms of brucellosis, 4 gave agglutination titres of 1 : 10 or 1 : 40, and 3 gave titres of 1 : 160 or 1 : 320. Some apparently healthy individuals had titres of 1 : 80.

Antibodies to Q fever were detected only in one second-year student, whose serum also agglutinated brucella at 1 : 20.—R.M.

Cedro, V. C. F., Cisale, H. O. & Maubecin, R. (1960). La prueba de sangre total en el diagnóstico rápido de brucelosis caprina. **[Whole-blood plate agglutination test for brucellosis in goats.]**—Rev. Invest. Ganad. No. 8 pp. 33-35. **1378**

Over 400 goats in herds in 3 provinces were subjected to the whole-blood plate agglutination test. Results indicated the efficacy of the test. Infection indices agreed with further laboratory tests. The test is rapid, practical, easy to apply and interpret and can be used for brucellosis surveys.

—T.E.G.R.

Gratzl, E. (1960). Spontane Tularämie bei Hunden. **[Tularaemia in dogs.]** — Wien. tierärztl. Mschr. **47,** 489-499. [Summaries in English, French and Italian.] **1379**

The symptoms of tularaemia in 2 dogs were akin to those of distemper: purulent discharge from the eyes and nose and fever, along with emaciation and pneumonia in one, and diarrhoea and nervous symptoms in the other. Radiography of the dog with pneumonia revealed sharply defined infiltrations in the lungs. Both dogs had agglutinins for *Brucella tularensis,* which disappeared after recovery with antibiotic treatment.

—M.G.G.

Clark, L. G., Kresse, J. I., Marshak, R. R. & Hollister, C. J. (1960). **Leptospira pomona isolations by direct blood culture of clinically infected cattle.** — J. Amer. vet. med. Ass. **137,** 668-669. **1380**

L. pomona was isolated from 6 cattle with clinical leptospirosis by adding 3 drops of blood from the jugular vein to Fletcher's semi-solid medium (Difco) containing 10% rabbit serum or 15% horse serum.—M.G.G.

Clark, L. G., Kresse, J. I., Marshak, R. R. & Hollister, C. J. (1960). **Leptospira pomona infection in an eastern red fox (Vulpes fulva fulva).**—Nature, Lond. **188,** 1040-1041. **1381**

The fox was trapped on a farm in

Pennsylvania in which *L. pomona* had been isolated from cattle and from surface waters. Its kidney yielded *L. pomona,* and its blood serum agglutinated *L. pomona* and *L. autumnalis.*—M.G.G.

Fraga de Azevedo, J. & Monteiro da Costa Faro, M. (1959). Sur la présence de la Leptospira hyos au Portugal. **[Isolation of L. pomona and L. hyos from pigs in Portugal.]** — Arch. port. Sci. biol. **12,** pp. 1-8. **1382**

Among 17 strains of leptospira isolated from kidneys of 94 slaughtered pigs in Lisbon, 9 were identified as *L. pomona* and 6 as *L. hyos.*—E.G.

Degtyarev, V. I. (1960). **[Leptospirosis in pigs in the Rostov area.]**—Veterinariya, Moscow No. 12 pp. 29-34. [In Russian.] **1383**

Twenty-two infected farms were investigated. The principal causal agent was *L. tarassovi* (? *L. hyos*) but *pomona* and *icterohaemorrhagiae* were also demonstrated serologically and bacteriologically. Mortality from leptospirosis was from 50 to 90% in pigs up to 14 weeks of age; in adults it was 2–5%. —R.M.

Hekimoğlu, H. (1960). Türkiyede bu güne kadar tesbit edilen leptospira tipleri. **[Leptospirosis in cattle, sheep and goats in Turkey.]** —Etlik Vet. Bakt. Enst. Derg. **1,** 87-97. [In Turkish. Summary in English.] **1384**

Hekimoğlu, H. (1960). Sığır leptospirozu ve abortus. **[Leptospiral abortion in cattle and sheep.]** — Ibid. 98-107. [In Turkish. Summary in German.] **1385**

Sera from 213 cattle and 25 sheep were tested for agglutinins to ten leptospiral serotypes. There were high titres to *L. saxkoebing, mitis, bataviae, australis.* The main types associated with animals in Turkey were *grippo-typhosa* and *saxkoebing.*

Of 38 sera from aborted calves, free from vibrio and brucella, 31 contained antibodies to *L. grippo-typhosa*; 544 of 975 sera from apparently healthy cattle were positive. Three of 4 sera from ewes that aborted were positive to *L. saxkoebing.*—R.M.

Anon. (1960). **I. Hosts and insect vectors of leptospirosis in Foochow: a preliminary survey. II. Further studies of animal hosts of leptospirosis in Kwangtung.**—Chin. med. J. **80,** 179 & 499. [In English.] **1386**

I. Eight strains isolated from rats, pigs, cow's milk and gamasid mites were identified as *L. bataviae* by cross-agglutination tests.

II. Complement-fixation tests were positive in 26 of 123 cows in Kwantung province, China, and one strain of *L. autumnalis* was isolated from the livers of 45 slaughtered cattle. Eleven of 56 sheep gave positive c.f. tests and from 52 livers 2 strains of *L. pomona* were isolated. Three of 28 cats gave positive c.f. tests but attempts to isolate leptospires from kidney or liver failed.—R.M.

Musaev, M. A. (1959). **[Problems of immunity to leptospirosis in animals.]** — Izv. Akad. Nauk Azerbaij. SSR No. 2 pp. 55-62. [In Russian.] **1387**

The role of the nervous system in the development of immunity to leptospirosis was studied. The appearance of antibodies was delayed in rabbits which had been given a sedative, and titres were 4–8 times higher in rabbits given acetylcholine.—M.G.G.

Jansen, B. C. (1960). **The diagnosis of pulpy kidney disease.**—J. S. Afr. vet. med. Ass. **31,** 15-20. **1388**

Occasional reports have been received at Onderstepoort of sheep dying from enterotoxaemia after dosing with phenothiazine. Enterotoxaemia was then induced experimentally by giving sheep a therapeutic dose of phenothiazine followed by introduction of 20 ml. of culture of *Cl. welchii* Type D into the duodenum. Sheep given only culture survived.

The disease can be diagnosed by the following findings: softening and reddening of the kidneys, accumulation of gas in the intestines, hydropericardium, *Clostridium welchii* Type D and practically no other bacteria in smears of intestinal contents, epsilon toxin in gut contents, *Cl. welchii* Type D in the liver and kidney, and antitoxin titres of less than 0·15 unit per ml. in the flock. —M.G.G.

Ramsay, W. R. (1960). **Tetanus in the kangaroo.**—Aust. vet. J. **36,** 412. **1389**

Symptoms observed in four cases are described. Tetanus had not been previously reported in the kangaroo.—A. Culey.

Eriksson, E. & Ullberg-Olsson, K. (1960). Hur stor är risken för stelkramp vid hundbett? **[How great is the risk of tetanus from dog-bites?]** — Medlemsbl. Sverig. VetFörb. **12,** 427-429. [In Swedish.] **1390**

The incidence in man in Sweden from this cause appeared to be 1 : 100,000 in five years. At the Veterinary College, Stockholm,

dog-bites in dogs are given only surgical treatment yet tetanus is extremely rare. Samples from the mouth of 100 army dogs were examined by anaerobic culture microscopically. In suspicious cases inoculation was made into tetanus broth and after growth sterile filtrates were inj. i/v into mice; none showed any signs of tetanus. It was concluded that the risk of tetanus from dog-bites should be no greater than from other contaminated wounds. Veterinarians should be immunized against tetanus.—F.E.W.

van Heyningen, W. E. & Miller, P. A. (1961). **The fixation of tetanus toxin by ganglioside.** —J. gen. Microbiol. **24,** 107-119. [Authors' summary modified.] **1391**

The fixation of tetanus toxin by brain ganglioside has been confirmed. The toxin-fixing capacity of ganglioside was assayed by using the analytical ultracentrifuge: under appropriate conditions it will fix many times its own weight of toxin. Ganglioside preparations from brain contain at least three gangliosides; at least two of these differ in their sialic acid contents and toxin-fixing capacities. The sialic acid residues (and their free carboxyl groups) are essential for toxin-fixation. Tetanus toxin does not seem to change the ganglioside molecule.

Schoop, G. (1961). Nachweis von Clostridium botulinum Typ C bei Rindern. **[Demonstration of Clostridium botulinum Type C in cattle.]**—Dtsch. tierärztl. Wschr. **68,** 71-72. [Summary in English.] **1392**

A brief report on the isolation of *Cl. botulinum* Type C from the contents of the rumen and small intestine of 2 cattle that died from suspected botulism.—M.G.G.

Dehmel, H. (1960). Über Botulismus-Impfstoff. **[Preparation of adsorbed botulism vaccine from culture dialysate.]**—Arch. exp. VetMed. **14,** 576-588. **1393**

The best medium for preparing botulinum toxin was found to be Tarozzi's liver broth with 0·05% agar at pH 7. Dialysed toxin was more potent than filtered toxin. Toxoid was prepared by mixing 100 parts of toxin with 20 parts of aluminium hydroxide. 0·3% formaldehyde was added and the mixture was held at 37°C. until it was no longer toxic for lab. animals (3 weeks). Assay methods were given.—R.M.

Kayser, J. (1959). Beitrag zur bakteriologischen Diagnostik der genitalen Vibrionen-Infektion beim Rind. **[Bacteriological diagnosis of genital vibriosis in cattle.]**—Inaug. Diss., Munich pp. 228. **1394**

K. isolated vibrios from 32 of 55 aborted foetuses, from 20 of 50 apparently normal foetuses in slaughtered cows, and from 39 of 58 preputial washings from bulls. Semi-solid thiol medium ("Bacto-thiol medium", Difco Laboratories) was preferred. K. saw no advantage in using brilliant green selective media. The 60 strains isolated were classified into *V. fetus,* aerobic catalase-positive vibrios, *V. bubulus,* and spirilla (2 strains from normal foetuses).—R.M.

Drapalyuk, E. I. (1960). **[Diagnosis of bovine vibriosis: influence of Strain 19 vaccination on reaction to the slow complement fixation test for vibriosis.]** — Veterinariya, Moscow No. 12 pp. 28-29. [In Russian.] **1395**

The test for vibriosis described by Trilenko [*V.B.* **26,** 1896], performed on sera from 699 cows on vibrio-infected farms, gave 17·8% positive and 20% doubtful results, whereas sera from 788 cows on uninfected farms gave 20% positive and 8% doubtful. A large proportion (99 of 162) calves inoculated with Strain 19 brucella vaccine were also positive. The test therefore appeared to be not specific.—R.M.

Ristic, M. & Walker, J. (1960). **Characterization of Vibrio fetus antigens. III. Study of serologic and biophysical properties of a polysaccharide fraction in a hemolytic system.** —Amer. J. vet. Res. **21,** 884-889. **1396**

A polysaccharide fraction, designated HS, was extracted from 2 strains of *V. fetus* and used for sensitizing sheep r.b.c. These sensitized cells were used for agglutination and lysis tests with sera produced in rabbits against 21 other strains of *V. fetus.* The haemolytic was generally more sensitive than the agglutination test in detecting *V. fetus* antibodies, although occasionally the agglutination test was positive when the haemolytic test was negative. Even with the more sensitive haemolytic test, the HS antigen did not represent a species-wide antigen.

Treatment of sheep r.b.c. with extract from one *V. fetus* strain did not affect their ability to adsorb another heterologous antigen. Sensitized r.b.c. were not lysed by sera against brucella and 4 strains of leptospira.

—W. J. Brinley Morgan.

Merritt, G. C. (1960). **The isolation of Fusiformis nodosus.**—Aust. vet. J. **36,** 388. **1397**

A medium for the cultivation of *F.*

nodosus [*V.B.* **29,** 1352] has been improved. An isolation method in which the medium is sown with material from lesions suspended in 0·25 molar sucrose gives far greater yields of *F. nodosus* colonies, apparently by checking the growth of other bacteria, particularly a motile fusiform organism.—D. ROBERTS.

Leaver, D. D. & Hart, I. H. (1960). **The etiology of abortion in dairy cattle in Victoria.** —Aust. vet. J. **36,** 46-48. [Authors' summary modified.] **1398**

Of 149 aborted foetuses examined bacteriologically over a 27 month period, 30 (20%) were excessively contaminated. Of the remaining 119, *Br. abortus* and *V. fetus* were isolated from 49·5 and 13·4% respectively. One yielded *Trichomonas foetus,* and in 36·5% there was no evidence of a cultivable infectious agent. The isolation of a catalase negative and H_2S negative strain of *V. fetus* from an aborted foetus, and the occurrence of fibrinous peritonitis in 4 foetuses affected with *V. fetus* are recorded.

Alexandrov, N. I., Gefen, N. E., Gapochko, K. G. & Garin, N. S. (1960). **[Aerosol immunization with dried live vaccines and toxoids. IV. Brucellosis, tularaemia, anthrax and plague vaccines.]**—J. Microbiol., Moscow No. 12 pp. 38-44. [In Russian. Summary in English.] **1399**

Br. abortus Strain 19-BA vaccine and anthrax STI vaccine were among the products administered in aerosol form by the method described in part III to sheep, g.pigs and monkeys. Following exposure of sheep to 10,000 million organisms of Strain 19-BA, the distribution of the bacteria in the body between 1 and 30 days afterwards was essentially similar to the distribution in sheep inoculated s/c except that the organism was recovered from the lungs of aerosol-treated sheep 24 hours (and not on subsequent occasions) afterwards. The distribution of anthrax organisms was similar to that of brucella organisms after aerosol or s/c administration of anthrax vaccine.—R.M.

I. Buchanan-Davidson, D. J., Seastone, C. V. & Stahmann, M. A. (1960). **Action of synthetic polylysine on the growth and phagocytosis of bacteria in vitro.** — J. Bact. **80,** 590-594. **1400**

II. Buchanan-Davidson, D. J., Stahmann, M. A., Neeper, C. A., Seastone, C. V. & Wilson, J. B. (1960). **Action of synthetic polylysine on experimental infections in animals.**—Ibid. 595-599. **1401**

I. The cationic synthetic polypeptide, polylysine, was bacteriostatic for *Salmonella typhi-murium,* at approx. 50 μg./ml. medium. At 1 to 1,000 μg./ml. it was bactericidal for *Staphylococcus aureus,* Type I pneumococcus, Group C β-haemolytic streptococcus, and spores of *Bacillus anthracis.* It agglutinated *Staph. aureus,* Type I pneumococcus, and Group C β-haemolytic streptococcus and precipitated the capsular polysaccharide from Type I pneumococcus and an umbilical cord hyaluronic acid. Polylysine greatly increased phagocytosis of Types I and II pneumoncocci, slightly increased that of Type III pneumococcus, did not affect that of either a Group A or C β-haemolytic streptococcus, and decreased that of *Staph. aureus.*

II. In mice infected i/p, polylysine (injected immediately, i/p) enhanced the infection with *S. typhi-murium,* had no effect on Group C streptococcus infection, and afforded significant protection against infection with Types I, II and III pneumococcus and spores of *B. anthracis.* When injected at a site other than that of the infecting Type I pneumococcus, polylysine afforded no protection. It did not protect against subcutaneous infection with *Staph. aureus.*

Merler, E., Perrault, A., Trapani, R.-J., Landy, M. & Shear, M. J. (1960). **Absence of endotoxic activity in materials derived without bacterial contamination from mammalian tissue.** — Proc. Soc. exp. Biol., N.Y. **105,** 443-445. [Authors' summary modified.] **1402**

In the attempted isolation from mammalian tissues of polysaccharides with endotoxic properties, materials devoid of such activity were obtained only under conditions in which exclusion of bacteria was demonstrated.

Keymer, I. F. & Austwick, P. K. C. (1961). **Moniliasis in partridges (Perdix perdix).** — Sabouraudia **1,** 22-29. [Summary in French. Authors' summary modified.] **1403**

An outbreak in artificially-reared partridges was associated with heavy losses. The clinical signs were mainly incoordination, but lesions were observed on the tongue, in the crop and on the digits of the affected birds. *Candida albicans* was isolated from all lesions and also in quantity from herbage and grit used by the birds. Histological examination showed the presence of the fungus in the

lesions without any marked reaction. Treatment with oxytetracycline hydrochloride and phenylmercuric dinaphthylmethane disulphonate was ineffective but the outbreak cleared up when nystatin was added to the drinking water.

Fraser, G. (1961). **The fungal flora of the canine ear.** — J. comp. Path. **71**, 1-5. [Author's conclusions modified.] **1404**

Moulds were comparatively rare in the external ears of healthy dogs and of dogs with otitis. The commonest species, *Aspergillus, Penicillium, Absidia* and *Rhizopus,* were equally prevalent in healthy and affected ears and were probably of no pathological importance.

Candida species occasionally gave rise to acute mycotic otitis as a result of prolonged antibiotic therapy. *Pityrosporum* species may be of aetiological significance in otitis by causing irritation of the epithelium of the external acoustic meatus, but they were also frequently present in healthy dogs.

Dermatophytes were not recovered from the ears of 35 clinically healthy dogs or of 277 dogs with external otitis.

Kiss, I. & Kelentey, B. (1960). Zur Behandlung der Pneumomykose der Hühnerküken mit Flavofungin. **[Flavofungin treatment of pneumonomycosis in chicks.]** — Dtsch. tierärztl. Wschr. **67**, 670-671. [Summary in English.] **1405**

Pneumonomycosis due to *Aspergillus nigrescens* broke out among 4,000 chicks on chaff litter. Twenty of 50 recovered when given 0·1 ml. of a 10% suspension of flavofungin [*V.B.* **28,** 2794] twice daily for 3 days, beginning 8–12 hours after the onset of symptoms, and all of 30 recovered when given this treatment at the first appearance of symptoms. Of 250 untreated chicks, all died. The flavofungin content of the blood of chicks reached a maximum of 7·5–8·7 μg./ml. two hours after administration of a single dose of 0·1 ml. of 10% suspension, followed by a decline to nil 6–8 hours after treatment. One to four hours after dosing the antibiotic was found chiefly in the intestine (11–12 μg./g.), followed by the lung (5·5–7·5 μg./g.) and liver (5–6 μg./g.). A dose of 0·1 ml. caused no toxic symptoms, 0·2 ml. caused slight intestinal catarrh, and 0·4 ml. was lethal.—M.G.G.

Diallo, M. S. (1960). Contribution à l'étude de la streptothricose cutanée des bovins. **[Cutaneous streptothricosis of cattle.]** — Thesis, Paris (Alfort) pp. 70. **1406**

D. discussed the main features of *Dermatophilus congolensis* infection in Africa. —M.G.G.

Kwapinski, J. B. (1960). **Researches on the antigenic structure of Actinomycetales. IV. Chemical and antigenic structure of Actinomyces israeli.** — Path. Microbiol., Basel **23,** 158-172. [In English. Summaries in French and German.] **1407**

Chemical composition and serological activity of 35 fractions isolated from four strains of the fungus were studied.—R.M.

Baynes, I. D. & Simmons, G. C. (1960). **Ovine epididymitis caused by Actinobacillus seminis, n. sp.**—Aust. vet. J. **36,** 454-459. [Authors' summary modified.] **1408**

Actinobacillus seminis n. sp. was isolated from the semen of one Merino and two Border Leicester rams with epididymitis. Two rams exposed to infection by injection of infected semen into the testes and epididymides, and one of two rams which received a culture by the same route, developed epididymitis.

Huddart, J. E. (1960). **Bovine contagious pleuropneumonia—a new approach to field control in Kenya.** — Vet. Rec. **72,** 1253-1254. **1409**

As this disease has increased in the last 2 years in southern Kenya, and vaccines are considered to be neither safe nor effective, a rapid c.f. test using diluted plasma has been developed to detect infected animals. A unit transported by a lorry has so far diagnosed the disease in 12 of 57 groups of herds in a zone dividing the infected from the uninfected area.—M.G.G.

Pande, P. G. & Sekariah, P. C. (1960). **A preliminary note on the isolation of Moraxella caprae nov. sp. from outbreak of infectious keratoconjunctivitis in goats.**—Curr. Sci. **29,** 276-277. **1410**

A Gram-negative, non-motile coccobacillus, provisionally named *Moraxella caprae* n. sp., was isolated from eye lesions of six goats, which included acute general inflammation of the eyes, corneal opacity and chronic keratitis. The organism was pathogenic for goats, mice and rabbits. Whether it was the sole agent or a secondary infection to a virus or rickettsia, was not established.—E.G.

Kovalenko, Y. R., Fomina, A. Y., Feoktistov, P. N., Akulov, A. V., Mitropol'skii, A. S. &

Shubin, V. A. (1960). **[Observations on the course of chronic respiratory disease of fowls.]**—Veterinariya, Moscow No. 12 pp. 34-42. [In Russian.] **1411**

In the Soviet Union the disease was first observed among Cornish chicks hatched from eggs imported from the U.S.A. during July and August 1959, and among Leghorn chicks from Canada. Since then the disease has been found on three other farms which reared chicks from eggs imported from the U.S.A. Details of the outbreaks are given. PPLO were isolated.—R.M.

I. Turner, A. S. (1960). **[Nomenclature of pleuropneumonia-like organisms.]** — Int. Bull. bact. Nom. Taxon. **10,** 255-256. **1412**

II. Edward, D. G. ff. (1960). **[Nomenclature of pleuropneumonia-like organisms.]** — Ibid. 256-258. **1413**

I. The FAO/OIE/CCTA Expert Panel on Contagious Bovine Pleuropneumonia agreed that the causal organism of pleuropneumonia should be given the generic name *Mycoplasma,* proposed by Freundt and incorporated in "Bergey's Manual". Examination of evidence on antigenic analysis by Villemot, J.M. and Provost, A. revealed at least 6 antigens among the strains of mycoplasma examined [see *V.B.* **30,** 2150]. Since *M. mycoides* var. *mycoides* and *M. mycoides* var. *capri* appeared to have only one common antigen approval was given to Provost's suggestion that they be regarded as distinct species to be known as *M. mycoides* and *M. caprae* respectively. A resolution to this effect was submitted for consideration by the International Commission on Bacteriological Nomenclature.

II. Arguments are advanced against the suggestion in the preceding abst. and for the previously suggested nomenclature *M. mycoides* var. *capri* [see *V.B.* **26,** 2235]. If future findings justified it, new genera could then be set up and species split off. The organisms causing contagious pleuropneumonia in cattle and in goats differ little from each other biologically (apart from antigenicity). In regard to ability of filtrates of old cultures to discolour r.b.c. and to liquefy inspissated serum, they differ from all other known organisms in the genus. For this reason the goat micro-organism was regarded as a variety of *M. mycoides* and it is considered that there is not yet sufficient evidence to justify its establishment as a separate species.—T.E.G.R.

Gavrilets, E. S. (1959). **[Microflora of the genital organs of cows.]** — Nauk. Pratsi L'viv. zoovet. Inst. **10,** 187-191. [In Ukrainian. Summary in Russian.] **1414**

Cultures were made from uterus and vagina of 36 clinically healthy cows and bacteria of 28 species were isolated. The results are shown in two tables. *Staph. aureus* was isolated from 16 cows, *Staph. citreus* from 15 and haemolytic streptococci from 3.—R.M.

See also absts. **1574** (report, disease, wastage and husbandry in British dairy herds); **1575** (health problems in captive dolphins and seals); **1659** (report, Tanganyika); **1660** (report, Sarawak); **1662** (new journal for human and animal mycology).

DISEASES CAUSED BY PROTOZOAN PARASITES

Godfrey, D. G. (1960). **Types of Trypanosoma congolense. I. Morphological differences.**—Ann. trop. Med. Parasit. **54,** 428-438. [Author's summary modified.] **1415**

Three types of *T. congolense* were recognized, each characterized by its range of mean lengths and by the proportion of short to long trypanosomal forms; they are termed the *congolense,* the intermediate and the *dimorphon* types.

For each type the mean lengths were generally longer in dogs than in cattle or sheep; in the one isolation studied in goats, the range of mean lengths was intermediate between that in dogs and that in cattle and sheep. In all these animals the mean lengths were relatively consistent.

Fluctuations in mean lengths and abnormal proportions of short to long trypanosomal forms occurred in some isolations in rats, and it is suggested that conclusions based on biometric studies in rats may be erroneous.

Evidence is put forward that the distinction between *T. congolense* and *T. dimorphon* is no longer valid, but that *T. congolense* is a complex of types, ranging from the short *congolense* type, through an intermediate and *dimorphon* type, to the longest, which corresponds to the *T. dimorphon* of Laveran and Mesnil (1904).

Lehmann, D. L. (1960). **Some culture differences between Trypanosoma rhodesiense and**

T. brucei in autoclaved diphasic media. — Ann. trop. Med. Parasit. **54,** 419-427. [Author's summary modified.] **1416**

Eight strains of *T. rhodesiense* and four of the *T. brucei* group were inoculated into two types of autoclaved media. During the early stages of the cultures (particularly at 24 hours) stained films showed certain morphological points of difference between the two species: in *rhodesiense,* rosettes were usually amorphous in over-all shape and were formed of rounded bodies; in *brucei,* this type of rosette was for the most part replaced by one composed of slender trypanosomes.

In early cultures there was also a difference in the relative numbers of two types of slender trypanosomes.

An additional point of difference between the two species was the percentage of viable forms after 24 hours in NN-autoclaved medium, with *brucei* averaging 53 and *rhodesiense* 14%. *T. brucei* also tended to show a greater over-all length of life in cultures than *rhodesiense.*

Of the nine *brucei* cultures, three adapted themselves to the media and produced sustaining cultures; only one of the 10 *rhodesiense* cultures succeeded in maintaining itself to the point of producing a continuing culture.

Weitz, B. G. F. (1960). **A soluble protective antigen of Trypanosoma brucei.** — Nature, Lond. **185,** 788-789. **1417**

An antigen demonstrated in the serum of rats with *T. brucei* infection was designated the exoantigen of *T. brucei.* It inhibited agglutination of living trypanosomes by the serum of rabbits immune to living trypanosomes and by the sera of rabbits and of rats immune to the exoantigen. Mice inoculated with trypanosomes and with rat serum containing exoantigen died before those given trypanosomes and normal rat serum or trypanosomes alone, the time of death being directly proportional to the concentration of exoantigen. Trypanosomes remained infective for mice longer when kept in suspensions containing the exoantigen. Repeated injection of exoantigen into mice and rats actively immunized them against living trypanosomes. —M.G.G.

Stephen, L. E. & Gray, A. R. (1960). **Suramin complexes. VI. The prophylactic activity of antrycide-suramin complex and antrycide chloride against Trypanosoma simiae in pigs.** — Ann. trop. Med. Parasit. **54,** 493-507. [Authors' summary modified.] **1418**

Large White pigs were challenged by *Glossina morsitans* infected with *T. simiae.* Antrycide-suramin complex administered subcutaneously at 20 mg./kg. body wt. appeared to protect pigs for 84, 92, 95, 96 and 117 days, though the periods might have been shorter had the challenge begun sooner. At 40 mg./kg. the drug protected three pigs for 96, 115 and 157 days; two pigs did not become infected during the 213 days of the experiment, despite a final challenge with wild-caught *G. morsitans.*

Antrycide chloride administered subcutaneously at 12·5 mg/kg. protected two pigs for 115 and 164 days; 25 mg. protected two pigs for 113 and 182 days; and 50 mg. protected two pigs against challenge with laboratory infected flies, though one of the animals became infected at 192 days after a final challenge by wild-caught *G. morsitans,* while the other resisted the final challenge and was thus protected for at least 213 days.

Metamidium chloride at 2 mg./kg., and in one case at 2·5 mg., failed to cure five break-through infections, but trypanosomes were cleared from the peripheral blood for 10, 14, 14, 16 and 37 days, thus indicating some therapeutic activity.

Antrycide-suramin complex at 20 mg./kg. cured four out of five break-through infections. The failure to cure one animal indicates that the trypanosomes might have developed a degree of drug resistance.

Neither prophylactic nor therapeutic treatments caused any systemic toxic effects.

Trypanosomes breaking through the prophylactic drugs proved to be still pathogenic: one large sow died in 25 days when no effort was made to treat the break-through infection, and another small pig died after only three days.

Data are provided for fly-challenge infection rates and for the rate and percentage of flies emerging from *G. morsitans* pupae collected in bush.

Rac, R. & Hreczko, I. (1960). **Trichomoniasis in chickens.**—Aust. vet. J. **36,** 473-474. **1419**

Three separate outbreaks of trichomoniasis are described. In each a distinct age group was affected, viz., chicks, breeding flock, old hens.—A. Culey.

Watt, L. & Jennison, R. F. (1960). **Clinical evaluation of metronidazole, a new systemic trichomonacide.** — Brit. med. J. September

24th, 902-905. [Authors' summary modified.] **1420**

A new derivative of imidazole, metronidazole (1-β-hydroxyethyl-2-methyl-5-nitroimidazole; "flagyl"), was investigated in the treatment of trichomonal vaginitis in 50 consecutive patients. Dosage was 600 mg. given by mouth daily for seven days. No local treatment was used. Test of cure included laboratory examination by direct and cultural methods.

Metronidazole appeared to be an effective trichomonacide when taken orally. Local treatment is apparently unnecessary.

Prasad, H. (1960). **Studies on the coccidia of some mammals of the families Bovidae, Cervidae and Camelidae.**—Z. Parasitenk. **20,** 390-400. [In English.] **1421**

P. examined 70 samples of faeces from 22 species of mammals in London Zoo and 10 samples from wildebeest in Tanganyika. Three new coccidia were described: *Eimeria pellerdi* from camel, *E. walleri* from the gerenuk *(Lithocranius walleri)* and *E. gorgonis* from the blue wildebeest *(Gorgon taurinus)*.—R.M.

Hammond, D. M., Ferguson, D. L. & Miner, M. L. (1960). **Results of experiments with nitrofurazone and sulfamethazine for controlling coccidiosis in calves.**—Cornell Vet. **50,** 351-362. **1422**

The addition of nitrofurazone to the drinking water of calves at 0·0004–0·0008% from the 10th–23rd day after oral administration of approx. a million sporulated oocysts of various coccidia, mainly *Eimeria bovis,* did not effectively control coccidiosis. The addition of nitrofurazone to milk at the rate of 15 mg. per kg. body wt. per day from the 2nd–15th day after inoculation was equally ineffective and had toxic effects. Nitrofurazone at the same rate in gelatin capsules or added to milk from the 12th–18th day after inoculation produced partial control but was not as effective as sulphadimidine treatment at 21·5 mg. per kg. on the 12th and 14th day after inoculation.

—A. Ackroyd.

Pellérdy, L. (1960). Vizsgálatok csirkék brunetti-coccidiosisának magyarországi előfordulásával kapcsolatban. **[Studies in connexion with outbreaks of Eimeria brunetti infection in Hungary.]**—Mag. állator. Lapja **15,** 410-413. [In Hungarian. Summaries in English and Russian.] **1423**

Thirty-five chicks aged 3–4 weeks were exposed to infection with *Eimeria brunetti* by placing amongst them an infected bird. Ten further 3-day-old chicks were artificially infected in groups of two with 1,000, 5,000, 10,000, 25,000 and 50,000 oocysts. Fourteen chicks from the first group and 5 from the second group died during a period of 10 days. Detailed post-mortem, histological and parasitological studies are described. It was considered that the pathogenicity was equal to that of *Eimeria necatrix* and the lesions were confined to the caeca, rectum and cloaca.

—A. Sebesteny.

Tsur-Tchernomoretz, I., Davidson, M. & Weissenberg, I. (1960). **[Two cases of bovine theileriasis (Th. annulata) with cutaneous lesions.]** — Refuah vet. **17,** In Hebrew: pp. 76-79. In English: p. 100. **1424**

An account is given of *Theileria annulata* infection in a bull and a cow. Both animals developed erythema with papules and pustules and numerous Koch's bodies were demonstrable in smears from the papules; extensive lymphatic cell-infiltration was observed throughout the dermis. Both animals recovered but the cow did not regain her general condition and the milk yield remained low.

—T.E.G.R.

Bigalke, R. D. (1960). **Preliminary observations on the mechanical transmission of cyst organisms of Besnoitia besnoiti (Marotel, 1912) from a chronically infected bull to rabbits by Glossina brevipalpis Newstead, 1910.** — J. S. Afr. vet. med. Ass. **31,** 37-44. **1425**

G. brevipalpis transmitted cyst organisms of *B. besnoiti* from a chronically infected bull to 4 rabbits, but did not transmit proliferative forms from acutely infected to susceptible rabbits. The tsetse flies were transferred alternately from infected to susceptible animals up to 37 times until they were engorged.—M.G.G.

Pols, J. W. (1960). **Studies on bovine besnoitiosis with special reference to the aetiology.**—Onderstepoort J. vet. Res. **28,** 265-356. **1426**

After reviewing the literature P. points out that the lack of a specific treatment and the fact that affected bulls may become sterile, make this disease economically important.

Studies on the aetiology are given in great detail. These include the description of the protozoan parasite, *Besnoitia besnoiti* (Marotel, 1912), development of the cyst wall, which is of somatic origin, the life cycle of the parasite and the classification. The com-

plicated history of the nomenclature is discussed and evidence is brought forward that *Besnoitia* is a valid genus related to the genera *Toxoplasma* and *Fibrocystis*. The characteristics do not permit placing the three genera in a natural scheme of classification in the Protozoa, and hence it is proposed to group them as "Parasites of Doubtful Nature".

—W. O. Neitz.

Schulz, K. C. A. (1960). **A report on naturally acquired besnoitiosis in bovines with special reference to its pathology.**—J. S. Afr. vet. med. Ass. **31**, 21-35. **1427**

S. summarized information collected over the past 18 years at Onderstepoort concerning *Besnoitia besnoiti* infection of cattle; there are 3 plates of illustrations of the parasite. The disease is not transmitted by direct contact, yet the intermediate host is not known. Diagnosis of the skin lesions rests on identifying the parasite in histological sections.—R.M.

Blažek, K. (1960). Die Pneumocystis-Pneumonie beim Feldhasen (Lepus europaeus Pallas). **[Pneumocystis pneumonia in a hare.]** — Zbl. allg. Path. path. Anat. **101**, 484-489. **1428**

This is stated to be the first report on *Pneumocystis carinii* infection in a hare. It was submitted to the State veterinary institute at Prague for P.M. examination.—R.M.

Burgisser, H. (1960). Toxoplasmose chez le chevreuil. **[Toxoplasmosis in deer.]**—Path. Microbiol., Basel **23**, 415-417. [In French.] **1429**

Lesions typical of toxoplasmosis were found in the brain of two young deer, aged about 6 months, captured while ill. B. stated that this was the first report of toxoplasmosis in deer.—R.M.

Marraghini, M. & Alosi, C. (1960). Ricerche sulla toxoplasmosi sperimentale del cane. Nota IV. Comportamento del glucosio nel sangue. **[Experimental toxoplasmosis in dogs. IV. Blood glucose.]**—Zooprofilassi **15**, 627-631. **1430**

In acute infection with fatal termination there was marked diminution in blood sugar levels; in survivors, variations were neither significant nor constant.—T.E.G.R.

See also absts. 1398 (aetiology of abortion in cattle in Victoria); 1659 (report, Tanganyika).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Rislakki, V. (1960). **Foot-and-mouth disease in Finland, 1959-1960. Some unsolved problems of the outbreak.**—Bull. Off. int. Epiz. **53**, 852-858. [In English.] **1431**

In this outbreak some animals showed small vesicles on the teats, gums and, occasionally, tongue. Erosions also occurred in some. There was neither salivation nor lameness. Temp. was slight to moderate, appetite was slightly diminished but milk yield was unaffected. Foot and mouth disease, ruled out clinically, was confirmed in the laboratory as due to Type O. Sheep and pigs were unaffected. There was further incidence of the disease but in affected herds infection did not spread to all the cattle, some pigs showed vesicles and/or erosions on the snout, and sheep were unaffected. In cattle there was no salivation, foot lesions were absent and lameness, when present, was due to tendovaginitis. Laboratory tests were negative. It is considered that the disease was caused by an attenuated virus (vaccination against Type C had recently been carried out in an adjoining area in Russia and vaccination against AO and AOC had been practised in 1952–1953).

—T.E.G.R.

Gralheer, H. (1960). Die Reindarstellung des neurotrop modifizierten Maul-und-Klauenseuche-Virus und seine physikalisch-chemischen Eigenschaften. **[Purification of a neurotropic strain of foot and mouth disease virus and its physical and chemical properties.]**—Arch. exp. VetMed. **14**, 856-903. **1432**

Type A guinea-pig virus adapted to the brain of mice by 1,300 passages was purified for the purposes of ultra-centrifugation by precipitation with methanol or ammonium sulphate, or by chloroform treatment. The sedimentation constant lay between 136 and 151 S. Electron microscopy revealed a particle size of 22 mμ.—R.M.

Borgen, H. C. (1960). **Titration of foot-and-mouth disease virus (FMDV) in calf kidney cultures and in mice.**—Acta vet. scand. **1**, 277-280. [In English. Summaries in German and Danish.] **1433**

In comparative titrations of the virus the titre obtained in calf kidney cell cultures was log 0·5 higher than that in unweaned mice.

—T.E.G.R.

Loddo, B. & Medda, A. (1960). La crescita del virus aftoso "O58" in colture primarie di

cellule renali tripsinizzate di cavia adulta. **[Growth of foot and mouth disease virus type O58 in trypsinized kidney cells of adult guinea-pigs.]**—Vet. ital. **11**, 657-664. [Summaries in English and French.] **1434**

F. & M. disease virus, type O 58, isolated from tongue lesions of cattle, was passaged serially on g.pig trypsinized kidney cells.
—T.E.G.R.

Skinner, H. H. (1960). **Some techniques for producing and studying attenuated strains of the virus of foot-and-mouth disease.**—Bull. Off. int. Epiz. **53**, 634-650. [In English. Summary in French.] **1435**

A detailed account is given of: attenuation of the F. & M. disease virus (by passage in white mice, and in 14-day chick embryos); tests for attenuation (in cattle, g.pigs and adult mice); cattle innocuity tests and small animal experiments; storage of attenuated strains and preparation of vaccine.—T.E.G.R.

Rivenson, S. (1960). Une nueva tecnica de evaluacion de vacunas antiaftosas en cobayos. **[Evaluation of foot and mouth disease vaccines in guinea-pigs.]**—Bull. Off. int. Epiz. **53**, 679-692. [In Spanish.] [In French pp. 693-706.] **1436**

Groups of 35 g.pigs were inoculated with 0·5 ml. of each test vaccine, a group of 35 being unvaccinated control. After 20 days each group (including control) was subdivided into lots of 5 and inoculated (i/d in the plantar pad) with 0·1–0·2 ml. of the homologous strain (C) suspended in buffer solution in tenfold dilutions of 10^{-1}–10^{-7}. After 7 days 50% homologous virus titres were assessed by the method described by Reed and Muench in vaccinated and in control g.pigs. The difference between the logs of these titres represented the vaccinal values given in tabular form.—T.E.G.R.

Leunen, J. & Strobbe, R. (1960). Essais de quatre méthodes de contrôle d'efficacité des vaccins anti-aphteux. **[Comparison of four methods of evaluating foot and mouth disease vaccines.]** — Bull. Off. int. Epiz. **53**, 707-731. **1437**

Of the 4 methods, that described by Henderson is considered the most accurate but difficult to apply. In the neutralization test it is necessary to titrate the serum of, at least, 15 cattle to obtain reliable results. The method described by Willems is satisfactory for the classification of vaccines as good or poor. That described by Lucam falls short in this respect; a modification of it (the "prolonged" test) renders such classification possible but a clear distinction cannot be made between vaccines with an average or a low index.
—T.E.G.R.

Hecke, F. (1960). **Testing of the foot-and-mouth disease vaccine in Germany.**—Bull. Off. int. Epiz. **53**, 732-742. [In English.] **1438**

An account of the testing of vaccines for sterility, infectivity and immunity at the German Federal Research Institute for Virus Diseases of Animals. [See also *V.B.* **30**, 3885.]—T.E.G.R.

Lucam, F. & Fedida, M. (1960). Méthode et normes pour une standardisation des vaccins anti-aphteux. **[Standardization of foot and mouth disease vaccines.]** — Bull. Off. int. Epiz. **53**, 743-765. **1439**

The first part of this paper gives details of a formula for the assessment of the potency of F. & M. disease vaccines [see *V.B.* **29**, 2429]. The second part deals with standardization and discusses 2 methods for the choice of a minimum efficacy value. In the third part the conditions adopted are defined and discussed.—T.E.G.R.

Ubertini, B., Nardelli, L., dal Prato, A., Panina, G. & Santero, G. (1960). La détermination quantitative des anticorps neutralisants et le titrage de l'antigène contenu dans le vaccin anti-aphteux. **[Determination of neutralizing antibodies and the titration of antigen in foot and mouth disease vaccine.]** —Bull. Off. int. Epiz. **53**, 1307-1327. [Summaries in English and Italian.] **1440**

The use of cattle for the testing of F. & M. disease vaccines involves practical difficulties. Seeking a suitable method of testing, using g.pigs, the authors found: (a) that the antigenic content of a vaccine could not be assessed by measuring the antibody titre after a single injection of the vaccine; (b) values of the limits of extinction of a vaccine could be calculated either by resistance to generalization of the infection after challenge, or by the presence of neutralizing antibodies, with good agreement.—F.E.W.

Büchlmann, E. (1960). Zur Tollwut des Rindes. **[Rabies in cattle.]**—Wien. tierärztl. Mschr. **47**, 785-787. **1441**

Symptoms of rabies in cattle that had been bitten in the hind legs by rabid dogs were strong labour pains in the absence of pregnancy leading to prolapse of the vagina and rectum, complete loss of appetite, hoarse

bellowing, and breaking of horns by violent butting. The incubation period was about 6 weeks.—M.G.G.

Scatterday, J. E., Schneider, N. J., Jennings, W. L. & Lewis, A. L. (1960). **Sporadic animal rabies in Florida.**—Publ. Hlth Rep., Wash. **75,** 945-953. **1442**

A review of sporadic cases of rabies in dogs, cats, foxes and raccoons in Florida. They appear to be due to contact with an inapparent reservoir that has yet to be identified. —M.G.G.

Moro S., M. (1958-59). Sobre un brote de rabia en alpacas. [**Outbreak of rabies among alpacas.**]—Rev. Fac. Med. vet., Lima **13-14,** 35-40. [Summary in English.] **1443**

In a flock of 330 alpacas 29 died of rabies after being bitten by infected dogs. An alpaca contracted rabies after being bitten by another one. Of 290 treated with Flury vaccine 30 developed paralysis (attributed to the use of a low passage strain of virus in the preparation of the vaccine) and died or were slaughtered *in extremis.*—T.E.G.R.

Kuwert, E. (1960). Komplementbindendes und infektiöses Antigen beim Tollwutvirus. I. Das Verhalten der beiden Komponenten im Verlaufe der Virus-fixe-Infektion. [**The complement-fixing and infective antigens of rabies virus. I. Their behaviour during infection of sheep, dogs, mice and guinea-pigs with fixed virus.**] — Arch. exp. VetMed. **14,** 1049-1072. **1444**

Animals were infected intracerebrally with the fixed virus strains "Pitman Moore" (mice) "Budapest" (sheep), "Novi Sad" (dogs) and the "Flury" strain (g.pigs). Complement fixation tests were done by the method of Bindrich & Kuwert [*V.B.* **28,** 2831]. Infective antigen was titrated in mice. Brain was examined from animals killed at 10-hour intervals between 10 and 120 hours after infection. Changes in c.f. titre and virus titre were described and compared. During the incubation period c.f. titre increased in parallel with virus titre. When the animals developed symptoms, the c.f. titre continued to rise while the virus titre fell. Between ½ hr and 30, 40 or 50 hours after intracerebral inj. there was a latent phase during which neither method detected virus in the brain.—R.M.

Bindrich, H. & Kuwert, E. (1960). Versuche über präinfektionelle und postinfektionelle Immunisierung gegen Tollwut bei Hunden unter besonderer Berücksichtigung von rabizidem Hundehyperimmunserum. [**Immunizing dogs against rabies before and after infection, with special reference to immune serum.**] — Arch. exp. VetMed. **14,** 676-690. **1445**

Immune serum against rabies that had been prepared in dogs was given to 32 dogs at different intervals after i/m injection of rabies virus. Rabies developed in none of 16 dogs treated one hour or 24 hours after infection, one of 8 dogs treated 48 hours after infection, 3 of 8 dogs treated 72 hours after infection, and 18 of 21 untreated controls. Of 11 dogs immunized with a single s/c dose of Högyes' living vaccine against rabies, all resisted challenge 4 or 8 weeks later, but of 20 dogs given up to 6 s/c injections of the Hempt killed vaccine [see *V.B.* **29,** 380] eight developed rabies on challenge. Neutralization titres were low or negative in 32 people that had received injections of the Hempt vaccine. —M.G.G.

Buslaev, M. A. & Mishchenko, N. G. (1960). [**Incidence of human rabies and its prophylaxis in the RSFSR.**]—J. Microbiol., Moscow No. 12 pp. 107-109. [In Russian.] **1446**

In the Russian Federated Republic 445,000 dogs "of valuable breeds" were immunized against rabies in 1958.—R.M.

Lassmann, G. (1960). Die Einschlusskörperbildung in der Kaninchenhornhaut nach intraokulärer Infektion mit originellem Kuhpockenvirus. [**Formation of inclusion bodies in rabbit cornea after inoculation of cow pox virus into the eye.**]—Path. Microbiol., Basel **23,** 184-192. [In German. Summaries in English and French.] **1447**

Inclusion bodies (IB) formed during the leucocytic phase of inflammation which is accompanied by oedema. IB were carried from blood vessels into surrounding tissue by basophile cells. Formation of IB ends with cessation of perivascular infiltration by inflammatory cells.—R.M.

Abdulla Khan, C. K. (1960). **Cultivation of sheep-pox virus.** — Indian vet. J. **37,** 296-302. **1448**

The author described a method of producing and titrating pure suspension of viral bodies of sheep-pox. He discussed the non-pathogenicity and non-adaptability of sheep-pox virus to g.pigs, rabbits, goats and the chorio-allantoic membrane of the chick

embryo, and recorded his own repeatedly unsuccessful attempts to adapt the virus.
—F.E.W.

Rafyi, A. (1960). Progrès réalisés dans la lutte contre les varioles ovine et caprine par la vaccination. [**Progress in the control of sheep pox and goat pox by vaccination.**] — Bull. Off. int. Epiz. **54**, 463-474. **1449**

Methods of immunization are reviewed and a description is given of the technique now employed at the Razi Institute for sheep pox vaccine production. Virus is obtained by the method described by Borrel, taking care to avoid contamination by other viruses, especially that of contagious agalactia, and the dose setting up a specific reaction is assessed. The virus is adsorbed on aluminium gel and later subjected to sterility and immunity tests. By the end of 1959 over 22·4 million doses of vaccine were issued. The vaccine immunizes against sheep pox only while the goat pox vaccine immunizes against both goat and sheep pox. In infected countries the neutralization test is employed for the identification of susceptible animals for virus production and for vaccine testing.—T.E.G.R.

Stakhanova, V. M. (1960). [**Respiratory viruses of horses, pigs and ducks and their relationship to human influenza virus.**]—Voprosy Virusologii **5**, 568-572. [In Russian. Summary in English.] **1450**

The following viruses were examined: A-equi Praha 1956 from horses; an English and a Czechoslovakian influenza virus from ducks; Newcastle disease virus (supplied by Moscow Veterinary Academy); swine influenza Strain 1–15 (supplied by A. S. Gorbunova); and eight human influenza strains. Haemagglutination, haemagglutination-inhibition, complement fixation and virus neutralization tests were applied. The results are shown in six tables. [An English translation will appear in *Problems of Virology* **5**, No. 6.]—R.M.

Varma, M. G. R., Webb, H. E. & Pavri, K. M. (1960). **Studies on the transmission of Kyasanur Forest disease virus by Haemaphysalis spinigera Newman.**—Trans. R. Soc. trop. Med. Hyg. **54**, 509-516. **1451**

Kyasanur Forest disease virus, serologically one of the Russian spring-summer encephalitis group of viruses, was demonstrated in 4 batches of larvae of the tick, *H. spinigera*, that had fed on experimentally infected chicks. Nymphs from all 4 batches transmitted the virus 24–73 days later to 25 of 33 uninfected chicks; and from one of these chicks a second chick-tick-chick cycle was accomplished. Adult ticks that had fed as larvae 126–127 days previously on infected chicks were released on a buffalo calf. The virus, and neutralizing and h.i. but not c.f. antibodies, were demonstrated later in the blood of this calf. In an area where people were suffering from Kyasanur Forest disease, 12 strains of the virus were isolated from unfed adult *H. spinigera* ticks, one each from *H. turturis* and *H. papuana*, and 2 from a mixed pool of *Haemaphysalis* species. It was suggested that *H. spinigera* may be the principal vector of this virus, which it acquires from monkeys and birds. [See also *V.B.* **31**, 779.]—M.G.G.

Pille, É. R. (1960). [**B virus infection in monkeys.**]—Voprosy Virusologii **5**, 542-547. [In Russian. Summary in English.] **1452**

Neutralizing antibodies were present in serum from 17·5% of 669 monkeys, but titres were rarely higher than 1 : 32. Incidence was lower in monkeys from India than in those from China and Viet-Nam. The virus was present in 0·1% of cell cultures prepared from the kidneys of 6,152 monkeys; attempts to isolate it from salivary glands of 152 animals failed.—R.M.

Ch'en Yi-teh and others. (1960). **Identification of natural infection to Japanese B encephalitis of swine and sheep in Hangchow.**—Chin. med. J. **80**, 189. [In English.] **1453**

Neutralization tests were positive in 68% of pigs and 49% of sheep (numbers not given). The virus was isolated from blood and brain of sheep. Blood was examined from 89 pigs and 78 sheep and brain from 11 sick pigs and 3 sheep.—R.M.

Gebhardt, L. P. & Hill, D. W. (1960). **Overwintering of Western equine encephalitis virus.**—Proc. Soc. exp. Biol., N.Y. **104**, 695-698. **1454**

The virus was injected i/p into 21 garter snakes (*Thamnophis* spp.) in December immediately before hibernation and was recovered from the blood of 4 out of 5 after 19 days, 6 out of 8 after 64 days, one out of 14 after 92 days, and 9 out of 14 after 139 days. It was also recovered from the brain of one and the blood of 2 out of 4 garter snakes kept for 17 days at 4°C. after i/p infection. [See also *V.B.* **31**, 749.]—M.G.G.

Wenner, H. A., Te-Yong Lou & Kamitsuka, P. S. (1961). **Experimental infections with Coxsackie viruses. I. Studies on virulence and pathogenesis in cynomolgus monkeys.**—Arch. ges. Virusforsch. **10,** 426-450. [In English. Authors' summary modified.] **1455**

Eighty-seven monkeys were inoculated by 4 different routes with 7 strains of Coxsackie virus. Most of the monkeys (84%) developed evidence of infection (development of antibodies, viraemia or presence of lesions in nervous tissues). While the clinical characteristics varied the general nature of infection was similar for each virus.

Twenty-nine monkeys developed paralysis, usually mild and transient, occasionally severe leading to death; 37 developed viraemia. Infection was more frequent after parenteral than after oral inoculation. Specific nerve lesions were found in a large proportion of monkeys killed before challenge with type 1 poliovirus. Myocarditis was found in 3, pericarditis in 2, and pancreatitis in 2 monkeys. Most monkeys recovering from Coxsackie virus infection were not spared the risk of paralysis with type 1 poliovirus.

Watanabe, S. (1960). **[Studies on equine infectious anaemia virus in tissue culture. III & IV.]**—Jap. J. vet. Sci. **22,** 181-191 & 215-222. [In Japanese. Abst. from English summaries. For Parts I & II see V.B. **31,** 109.] **1456**

No macroscopic cytopathic changes were seen within 14 days of incubation in cultures of horse embryo cells inoculated with the virus. Cell degeneration after 30–50 days of incubation commenced earlier and was more severe in cultures inoculated with infective horse serum than in cultures inoculated with normal horse serum. Factors affecting virus proliferation were discussed.—R.M.

Saxer, E. (1960). Informe al gobierno de Venezuela sobre laboratorios de veterinaria con especial referencia a la anemia infecciosa del caballo. **[Report to the Government of Venezuela on veterinary laboratories, with special reference to equine infectious anaemia.]** pp. 20. Rome: Food and Agriculture Organization of the United Nations. [FAO Report No. 1213.] **1457**

From March 1957 to December 1959 the author was adviser to the Venezuelan government on the organization of veterinary laboratories, with special reference to diseases caused by viruses and to diseases of horses, in particular equine infectious anaemia. An experimental station for the study of horse diseases was built under his direction. An account was given of the history, clinical picture and P.M. findings of equine infectious anaemia in Venezuela, where serological tests indicated that the disease is widespread. Electrophoresis of blood serum revealed a pronounced decline in albumin content and an increase in gamma-globulin both in acutely infected horses and in symptomless in-contact horses. Recommendations were made on the management of horse studs and of veterinary laboratories, and on further research into equine infectious anaemia.—M.G.G.

Tadros, M. M., Kamel, J. & Ghaffar, S. A. (1960). **A modified method for the preparation of a freeze dried horsesickness vaccine in Egypt.**—J. Egypt. vet. med. Ass. **20,** 27-42. [In English.] **1458**

The modifications necessary to prepare concentrated freeze-dried African horsesickness vaccine containing the 7 types of virus attenuated by passage through the brains of mice are described. Sterilization of the M/50 lactose peptone buffer diluent had to be performed by means of a Seitz filter using E K grade filter disks and not by steam sterilization. Prolonged centrifugation of the brain emulsions was also detrimental. The use of ether at a concentration of 2% as a volatile bacteriostatic agent was satisfactory. The potency of the final vaccine was unaffected by remaining 11 days at room temperature and still had a titre of 1 : 1,751 after storage for 19 months at −20°C.—A. Ackroyd.

Stone, S. S. & Moulton, W. M. (1961). **A rapid serologic test for rinderpest.**—Amer. J. vet. Res. **22,** 18-22. [Authors' summary modified.] **1459**

A rapid complement-fixation test for diagnosis of rinderpest is described, using tissue extracts from infected cattle as antigen. Mesenteric, mandibular, and prescapular lymph nodes were collected from cattle 4–10 days after infection and up to 12 hours after death. Antigen was extracted from these nodes by high-speed homogenization followed by differential centrifugation. Significant fixation of complement was obtained in one hour, using constant volumes and concentrations of antigen and antiserum and varying dilutions of complement. (Such a reaction was not obtained with either normal rabbit serum or non-infected bovine tissue.) Antigen prepared from tissues collected 5–7 days after infection fixed five 50% haemolytic units of

complement in dilutions from 1 : 100 to 1 : 400 in one hour and from 1 : 200 to 1 : 560 overnight.

High ratios of antigen to antiserum resulted in a prozone phenomenon.

Comparable results were obtained using Pendik, Pak Chong (buffalo), and Kabete strains of rinderpest.

Brown, R. H. & Scott, G. R. (1960). **Vaccination of game with lapinised rinderpest virus.** —Vet. Rec. **72,** 1232-1233. [Authors' summary modified.] **1460**

In 72 head of wild game of 12 species injected with lapinized rinderpest virus, the over-all mortality was 19·4%. The species with the least resistance were Grant's gazelle *(Gazella granti),* bush-pig *(Potamochoerus porcus)* and wart-hog *(Phacochoerus aethiopicus).* Deaths also occurred amongst reticulated giraffe *(Giraffa reticulata),* waterbuck *(Kobus ellipsiprymnus)* and white-bearded wildebeest *(Connochaetes taurinus* Buchell).

Turton, J. D. (1960). **Some observations on the thermal response of rabbits to the administration of lapinised rinderpest virus in a tropical environment.**—Bull. epiz. Dis. Afr. **8,** 191-198. [Summary in French. Author's summary modified.] **1461**

T. gave data illustrating seasonal variation in the normal rectal temperatures of rabbits kept in a tropical environment.

The environmental conditions were shown to affect the thermal reactions induced by inoculation of lapinized rinderpest vaccine. Thermal reactions in rabbits rejected and rabbits accepted for the production of lapinized rinderpest vaccine were compared: significant differences were demonstrable.

de la Vega D., E., Málaga T., A. & Moro S., M. (1958-59). Fiebre catarral maligna de los bovinos en el Peru. **[Bovine malignant catarrh in Peru.]**—Rev. Fac. Med. vet., Lima **13-14,** 70-85. [Summary in English.] **1462**

An account of the disease in 3 animals. It is stated that this is the first report of bovine malignant catarrh in Peru.—T.E.G.R.

French, E. L., Snowdon, W. & Egan, A. N. (1960). **The occurrence of sporadic bovine encephalomyelitis in Australia.**—Aust. vet. J. **36,** 444-445. **1463**

French & Snowdon report the isolation of *Miyagawanella* from the brain of a calf exhibiting the clinical signs of encephalitis.

Egan describes the clinical and epidemiological features of this and similar cases, which on evidence presented are presumed to be typical cases of sporadic bovine encephalomyelitis, a disease not previously recorded in Australia.—A. Culey.

Edwards, M. J. & Sier, A. M. (1960). **Bovine epizootic diarrhoea in Western Australia.** — Aust. vet. J. **36,** 402-404. [Authors' summary modified.] **1464**

The disease was characterized by diarrhoea, rapid spread, high morbidity and low mortality. It appears to be identical with that reported from New South Wales [*V.B.* **30,** 413] and Queensland. Its infectious nature was confirmed by transmission tests.

Robson, D. S., Gillespie, J. H. & Baker, J. A. (1960). **The neutralization test as an indicator of immunity to virus diarrhea.**—Cornell Vet. **50,** 503-509. **1465**

By the sequential rule of experimentation with 59 initially serologically negative calves which were inoculated with virus diarrhoea and subsequently challenged, a tissue culture serum-virus neutralization test was found to be at least 95% accurate in assessing immunity; this test was therefore a substitute for direct challenge in studies on the efficacy of vaccines used for the prevention of virus diarrhoea.—A. Ackroyd.

Whiteman, C. E. (1960). **Histopathology of the adrenal cortex and adenohopophysis in cattle with mucosal disease.** — Dissertation, Iowa pp. 113. [Abst. from Diss. Abstr. **20,** 4494-4495.] **1466**

A histological study was made of the adrenal cortex in 42 cattle with mucosal disease as it occurs in Iowa. Twenty-five pituitaries from the same cattle were similarly studied. Differential cell counts were made in the adenohypophyses of 20 of the 25 pituitaries. Adrenals and pituitaries of 18 affected cattle were weighed and plotted against the estimated ages of the cattle.

Thicknesses of two adrenal cortical zones were measured, and counts of nuclei were made in 18 affected adrenals.

Adrenals and pituitaries from 14 normal cattle were compared in various ways with tissues from infected cattle.

The pituitaries of infected cattle were congested and were thought to be smaller. The adenohypophyses contained less basophiles, less acidophiles and more chromophobes than in normal cattle.

All adrenals from 19 cattle that died of

mucosal disease had lymphocytic infiltration, with occasional eosinophiles, in trabecula-capsule junctions. The infiltration was also present in the adrenals of 18 of 23 affected cattle killed with electricity. In most affected cattle the adrenal capsules were thin.

In the adrenals of infected cattle, fatty change was present in all cortical zones, especially in the zona fasciculata and zona reticularis. This was in marked contrast to the lipid-poor condition of normal bovine adrenals. Oil red O-stainable lipids corresponded in location and concentration with fatty change. In infected cattle mild parenchymatous cell necrosis was observed. Haemorrhage, when present, occurred predominantly in the peripheral third of the zona fasciculata. Hyaline-like droplets were frequently present in the sinusoids. Cholesterol accumulations were present in the zonae glomerulosae in five of ten pairs of affected adrenals.

Adrenals from infected cattle were larger and heavier than adrenals from normal cattle and cortical zones were thicker, apparently because of increased cell size.

Abinanti, F. R. & Plumer, G. J. (1961). **The isolation of infectious bovine rhinotracheitis virus from cattle affected with conjunctivitis —observations on the experimental infection.** — Amer. J. vet. Res. **22**, 13-17. [Authors' summary modified.] **1467**

Conjunctivitis was observed in about two-thirds of a group of 125 yearling beef cattle. Clinically, it simulated keratoconjunctivitis or "pink eye", but without corneal opacity or ulcer formation. Respiratory signs were not observed. Four isolates of infectious bovine rhinotracheitis virus were recovered from the ocular and nasal secretions. Conjunctivitis was set up in calves inoculated in the conjunctiva with one of these isolates or with a California isolate of infectious bovine rhinotracheitis virus; subsequently serum samples from these calves had reciprocal neutralizing antibodies against each virus.

Gründer, H.-D., Reuleaux, I.-R. & Liess, B. (1960). Feststellung der virusbedingten Rhinotracheitis infectiosa des Rindes. I. Herkunft und Isolierung des Virus. **[Identification of infectious bovine rhinotracheitis. I. Origin and isolation of the virus.]**—Dtsch. tierärztl. Wschr. **67**, 514-519. **1468**

Liess, B., Knocke, K.-W. & Schimmelpfennig, H. (1960). Feststellung der virusbedingten Rhinotracheitis infectiosa des Rindes. II. Kulturelle, serologische und elektronenoptische Charakterisierung des Virus unter Berücksichtigung der in Gewebekulturen auftretenden zytopathischen Veränderungen. **[Identification of infectious bovine rhinotracheitis. II. Cultural, serological and electron microscopical characteristics of the virus and its effect on tissue culture cells.]**—Ibid. **67**, 551-558. [Summaries in English.] **1469**

I. Two Darjeeling bulls imported into Germany from India 6 months previously died from a disease resembling malignant catarrh. They did not respond to treatment with antibiotics or sulphonamides. At Hanover Veterinary College a Friesian bull aged 4 months was inoculated s/c with blood from one of the bulls. After an incubation period of 8 weeks it developed a similar illness and died after 4 days despite treatment. Blood collected before it died was used for subsequent virological studies. Virus-like particles were seen in stained smears of nasal and ocular discharge.

II. The virus was cytopathic and formed intranuclear inclusion bodies in cultures of ox kidney and testis cells. The titre obtained in cultures of testis cells was similar to that reported for infectious bovine rhinotracheitis virus in kidney cells. Virus did not survive more than 2 passages in embryonated eggs. Serologically, it was identical with the virus of infectious pustular vulvovaginitis, which is serologically indistinguishable from infectious bovine rhinotracheitis virus [see *V.B.* **30**, 117]. The development of virus elementary bodies was followed under the electron microscope.—M.G.G.

Bindrich, H. (1960). Untersuchungen über das Virus des Bläschenausschlages des Rindes (Exanthema coitale vesiculosum bovis). **[Studies on the virus of coital vesicular exanthema in cattle.]**—Arch. exp. VetMed. **14**, 656-675. **1470**

A virus isolated from a heifer with coital vesicular exanthema underwent 36 passages in calf kidney cells. The cells became rounded, and eosinophilic inclusion bodies were seen. The titration end-point of the virus in tissue culture was between the dilutions 10^{-6} and 10^{-7}. In size it was between 150 and 225 mμ. It was inactivated by exposure to 56°C. for 45 min. Infectivity persisted for 14 months at −30°C. Freeze-dried, it was stored for at least 4 months at +5°C. without loss of titre. The cultured virus reproduced the disease in heifers infected intravaginally, and con-

junctival infection in rabbits caused specific conjunctivitis. But intravaginal inoculation of sheep and rabbits, intracerebral inoculation of unweaned mice and injections into embryonated eggs were unsuccessful. Cattle infected intravaginally had little or no neutralizing antibody in the blood serum, and developed the disease again when re-infected by the same route. But a pronounced rise in titre was observed in a bull that developed bronchitis and fever after intratracheal infection.—M.G.G.

Huygelen, C., Thienpont, D., Dekeyser, P. J. & Vandervelden, M. (1960). **Allerton virus, a cytopathogenic agent associated with lumpy skin disease. II. Inoculation of animals with tissue culture passaged virus.**—Zbl. VetMed. **7,** 754-760. [In English. Summaries in French, German and Spanish.] **1471**

Local skin lesions that formed at the point of inoculation were characterized by reddening and thickening of the skin followed by scab formation in rabbits and goats, but were of a necrotic type in calves, sheep and g.pigs. Multinucleate giant cells similar to those observed in tissue cultures were observed in the skin lesions of infected baby mice. [See also *V.B.* **31,** 113.]—M.G.G.

Cliver, D. O. (1960). **The neutralization of certain enteroviruses by colostrum, milk, and serum and the occurrence of these viruses in dairy animals.** — Dissertation, Ohio pp. 78. [Abst. from Diss. Abstr. **21,** 6.] **1472**

Serum and colostrum from seven parturient cows, milk from these animals after a week or more of lactation, and serum from their offspring before and after sucking were tested for their ability to neutralize bovine enteroviruses of two standard strains obtained from the same herd, and in some cases autogenous virus strains. In most cases the descending order of the neutralizing potencies was as follows: colostrum, parturient cow serum, calf serum after sucking, calf serum before sucking, and normal milk.

Five milkings before calving depleted the neutralizing potency of the mammary secretions in one case. The ability of the calf to absorb into its serum the antibody content of the first ingesta, was greatly impaired within 22 hours after birth.

Weekly rectal swabs from 12 calves beginning between birth and four weeks of age indicated that calves could shed viable enterovirus at about eight weeks of age. Antibody in the sera of these calves apparently did not prevent infection and excretion of enterovirus. One mature cow was found to be shedding a strain of enterovirus against which her serum had little neutralizing capacity. Virus excretion was not correlated chronologically with clinical signs.

At least two strains of enterovirus which were distinct on serological and other grounds were isolated from animals in the herd. Evidence of mixed infections with these strains is presented.

Howell, P. G. (1960). **A preliminary antigenic classification of strains of bluetongue virus.**—Onderstepoort J. vet. Res. **28,** 357-364. [Author's abst.] **1473**

By means of *in vitro* serum-virus neutralization tests, in roller tube tissue cultures of lamb kidney cells, it has been possible to classify strains of bluetongue virus. Convalescent sheep sera, which proved to be sufficiently type specific, were used for the identification of isolates. In the preliminary investigation no less than 12 distinct antigenic types of bluetongue virus were established. The methods employed and the limited number of strains involved in this study did not permit an evaluation of antigenic variations within a type.

Ognyanov, D. (1960). **[Ovine virus abortion in Bulgaria.]** — Nauch. Trud. vet. Inst. Virusologiya, Sofia **2,** 107-113. [In Bulgarian. Summaries in English and Russian.] **1474**

The disease was confirmed in 1958. Of 20 lambs from infected flocks, sera from 5 contained complement-fixing antibody, believed to have been acquired from colostrum. [See also *V.B.* **31,** 116.]—R.M.

Thormar, H. (1961). **Stability of visna virus in infectious tissue culture fluid.**—Arch. ges. Virusforsch. **10,** 501-509. [In English. Author's summary modified.] **1475**

The effect of various physical and chemical agents on the stability of tissue-cultured visna virus [see *V.B.* **29,** 516] was studied. Storage at – 50°C. for several months and repeated freezing and thawing did not significantly reduce titre. At temperatures from 0° to 47°C. the infectivity was gradually lost, the 90% inactivation period being from 30 days to 27 minutes. Heating at 57° for 28 min. inactivated the virus completely. The virus was most stable at slightly alkaline pH. It was easily inactivated by formaldehyde, ethyl alcohol and phenol. Ethyl ether and trypsin also inactivated it.

Butozan, V. & Mihajlovitch, S. (1960). La propagation du piétin du mouton et la lutte contre cette maladie en Yougoslavie. **[Propagation of foot rot in sheep and its control in Yugoslavia.]** — Bull. Off. int. Epiz. **54,** May pp. 475-481. **1476**

The disease is enzootic and spreads slowly, especially during summer and at pasture, while in sheep folds, particularly in winter and spring, it spreads rapidly. Infection takes place at pasture, on stock routes and in sheep folds where healthy and infected animals come in contact. Sheep with latent infection play an important epidemiological role. Predisposing factors do not appear to play an important role. Pure bred animals are more susceptible than native sheep. Incidence is 8–92% and mortality about 5%. Aetiology is obscure but a virus is suspected, with bacteria as secondary invaders. Healthy sheep were infected with filtered hoof material [route not stated]. Surgical intervention combined with chemotherapy gives good results and the disease has been eliminated from some regions where this treatment was applied in conjunction with sanitary measures.

—T.E.G.R.

Baker, J. A. & Sheffy, B. E. (1960). **A persistent hog cholera viremia in young pigs.**—Proc. Soc. exp. Biol., N.Y. **105,** 675-678. [Authors' summary modified.] **1477**

Persistent swine fever viraemia was produced by a lapinized virus in pigs (aged 6 weeks) from non-immune sows, but not in pigs of that age from immune sows nor in pigs aged 3 months from non-immune sows. Although immunological tolerance has been reported in other animals, it was produced either before or shortly after birth. These pigs, therefore, appear unusual because persistence of virus was established at an older age. Pigs with persistent viraemia failed to grow and showed elevated temperatures but survived for periods from 6 to 17 weeks. During this interval, persistent virus reverted to a fully virulent state. When they became moribund, virus titres of spleens from stunted pigs ranged from 10^7 to 10^9 in contrast to 10^5 found in spleens from moribund pigs infected with virulent virus in the usual manner. The ability of swine fever virus to infect *in utero* and to persist in pigs after birth may have epidemiological implications.

Mathews, J. (1960). **Temperature response following hog cholera vaccination as influenced by swine isoagglutinins.**—Cornell Vet. **50,** 412-416. **1478**

When 11 pigs whose r.b.c. were strongly agglutinated by a hyperimmune swine fever serum, were vaccinated against swine fever by the simultaneous method using this agglutinating serum, 9 showed temperature elevations within one week of vaccination and were off feed. No temperature elevation occurred after vaccination in 4 of 6 animals showing no agglutination. The added stress of an isoagglutination reaction may be the deciding factor in initiating an outbreak of swine fever following vaccination.—A. Ackroyd.

Oláh, P. (1960). Lapinizált sertéspestis-virussal oltott sertések vérképének vizsgálata. **[Haematology in pigs vaccinated with lapinized swine fever virus.]**—Mag. állator. Lapja **15,** 363-367. [In Hungarian. Summaries in English and Russian.] **1479**

The effects of lapinized swine fever vaccine were studied on 260 pigs weighing 36–45 kg. by making daily or 48-hourly white blood cell counts and observing clinical symptoms. In 88 pigs which received the official dose of vaccine without serum, the w.b.c. count rose by 35–70% during the first 24–48 hours, then rapidly decreased until it reached 31–42% of its original value on the 7–9th day, and it was eventually restored on the 13th day. The leucopenic period was accompanied by a rise in temperature. From the total of 184 pigs given the vaccine alone, 9 died with typical swine fever symptoms, 154 had fever and inappetance and 21 remained unaffected. Severity of symptoms was proportionate to degree and duration of leucopenia. On the other hand it has been shown on two groups of 8 pigs which received lapinized virus of different titres, that the severity of symptoms and leucopenia is—amongst other factors—correlated with the concentration of the virus received. In several pigs exacerbation of a dormant pneumonia was observed on the 4–6th day after vaccination, *i.e.,* during the leucopenic period, as a result of which the w.b.c. count rose rapidly on the 6th day to values of 35–45,000 per cu. mm. Three groups of 8 pigs received lapinized virus, crystal violet vaccine and rabbit liver suspension respectively. In all groups an initial leucocytosis was observed suggesting that it is a non-specific foreign protein reaction, but the consequent fall in w.b.c. occurred only in the group given lapinized vaccine. It has been demonstrated

on groups of 8 pigs that a minimal simultaneous dose of 15 ml. of swine fever serum is required to counter the depressing action on the w.b.c. count of the official dose of lapinized vaccine. Of 2 groups of 8 pigs one group had been vaccinated with crystal violet vaccine, the other with lapinized vaccine alone, and both were challenged with virulent swine fever virus 30 days after vaccination. In the "crystal violet" group the w.b.c. count fell to 40% of its original value on the 4–5th day after challenge, but in the "lapinized" group the blood picture remained unaffected.

—A. SEBESTENY.

Bonchev, N. & Khristov, S. (1960). **[Production of swine fever immune serum by hyper-immunizing pigs with lapinized virus.]** — Nauch. Trud. vet. Inst. Virusologiya, Sofia **2**, 81-85. [In Bulgarian. Summaries in English and Russian.] **1480**

The authors claimed that the Rovac strain of lapinized virus was just as good as fully virulent virus for hyper-immunizing pigs.

—R.M.

Gillespie, J. H., Sheffy, D. E. & Baker, J. A. (1960). **Propagation of hog cholera virus in tissue culture.**—Proc. Soc. exp. Biol., N.Y. **105**, 679-681. [Authors' summary modified.] **1481**

A strain of swine fever virus has been procured that produced cytopathic effects in tissue cultures of pig kidney cells. This tissue cultured virus produced typical swine fever when inoculated into susceptible pigs and it was neutralized by immune sera.

Kafel, S. (1960). **The significance of salmonella in the course of swine fever, from the standpoint of meat hygiene.** — Biul. Inst. Wet. Puławy, **4**, 1-7. [In English.] **1482**

K. examined for salmonella the organs of 37,304 pigs infected with swine fever virus for the purpose of vaccine production. Of 2,540 strains isolated, 2,420 were *S. cholerae-suis* and 120 were *S. typhi-murium*. Incidence varied from year to year but on average salmonella were recovered from 6·4% of pigs. The organisms were isolated from liver in 62% of infected pigs, from spleen in 45%, from kidneys in 44%, from lungs in 33%, from lymph nodes in 28%, from muscle in 17% and from gall bladder in 9%.

It was concluded that salmonella infection was an uncommon complication of swine fever. From the point of view of meat inspection it was probably safe to pass swine fever carcasses for human consumption in view of the low incidence of muscle infection with salmonella. Other organisms like *E. coli, Proteus, Pasteurella,* staphylococci, streptococci, *Pseudomonas pyocyanea* greatly outnumbered salmonella in the carcasses examined, so that bactergiological inspection of the meat was advisable.—R.M.

Griem, W. (1960). Ein Beitrag zu den Kernveränderungen der Nebennierenrindenzellen bei postmortaler Autolyse und Schweinepest. **[Nuclear changes in cells of the adrenal cortex, due to post-mortem autolysis and swine fever.]** — Dtsch. tierärztl. Wschr. **67**, 583-587. [Summary in English.] **1483**

The nuclei of the cells of the zona fasciculata in 10 healthy pigs decreased by 8% twelve hours after slaughter, 15% after 24 hours, 23% after 48 hours, and 40% after 72 hours. In 44 pigs that died from swine fever, the volume of the nuclei was lowest in those with haemorrhagic inflammation of the stomach and intestine, highest in those with chronic swine fever accompanied by encephalitis or pneumonia, and of intermediate size in those with septicaemia. The nuclei were packed more closely in pigs that died from acute swine fever than in those that died from the chronic disease. It was concluded that there is insufficiency of the adrenal glands in swine fever, and that the time of exhaustion of the adrenal glands influences the P.M. findings.—M.G.G.

Fischer, K. (1960). Vergleichende morphologische Untersuchungen des Zwischenhirn-Hypophysensystems gesunder und an Schweinepest oder Maul- und Klauenseuche erkrankter Schweine. **[Morphology of the hypothalamus-pituitary system in healthy pigs and pigs with swine fever or foot and mouth disease.]** — Arch. exp. VetMed. **14**, 918-938. **1484**

F. examined histologically the hypothalamus and pituitary gland from 30 normal pigs, 93 infected by various ways with swine fever, and 12 killed 12 days after s/c inj. of F. & M. disease virus. Special attention was paid to the supraoptic and paraventricular nuclei of the hypothalamus and the posterior lobe of the pituitary: in these parts there was higher content of neurosecretory substances (demonstrated by chromhaematoxylin-phloxin stain) in virus-infected pigs than in normal pigs. The most pronounced changes were found in pigs killed 6–21 days after infection

with swine fever virus: damage to ganglia cells was present in the supraoptic nucleus. —R.M.

Bonchev, N. (1960). **[I. Aetiological studies on virus pneumonia in piglets. II. Cultivation of porcine pneumonia virus in chick embryos.]**—Nauch. Trud. vet. Inst. Virusologiya, Sofia **2**, 87-92 & 93-98. [In Bulgarian. Summaries in English and Russian.] **1485**

Lungs from 30 unweaned Bulgarian pigs with a disease clinically and pathologically resembling virus pneumonia were examined for bacteria and viruses. No bacteria were isolated from 20 of the lungs. 10% suspensions of lung tissue were inoculated into mice, rabbits and chick embryos: no illness or pneumonia occurred in these animals. Buffered suspension from 5 lungs was injected into the trachea and nose of 9 piglets aged 4–6 weeks. Five developed pneumonia 12–15 days later. Virus in 2 of the original lung suspensions was passed 6 times in piglets. Lesions typical of virus pneumonia were found in the lungs. The virus was grown in chick embryos at 5–6 days of incubation and had been passed 10 times in them. No direct comparison was made with pneumonia virus from other countries.—R.M.

Grubliauskas, L. (1958). Paršeliu gripas, jo gydymas ir profilaktika LTSR kolukiuose ir tarybiniuose ukiuose. **[Piglet influenza in Lithuania. Predisposing factors and prophylaxis.]**—Trudy Litovsk. vet. Akad. **4**, 67-75. [In Lithuanian. Abst. from Russian summary.] **1486**

Piglet influenza was found in 26 of 35 districts investigated. Secondary infection (with *Past. multocida, Salm. cholerae-suis, E. rhusiopathiae, E. coli* etc.) was present in 43 of 120 piglets. Losses were greatest between November and March. The disease could be eradicated in 1–3 years providing nutrition was good and carriers of infection were removed.—R.M.

Wenner, H. A., Beran, G. W. & Werder, A. A. (1960). **Enteroviruses of swine. II. Studies on the natural history of infection and immunity.**—Amer. J. vet. Res. **21**, 958-966. **1487**

The presence of enterovirus [see *V.B.* **29**, 92] in the faeces of a herd of pigs was not correlated with outbreaks of enteritis and atrophic rhinitis. The virus was isolated, within 2 weeks of birth, from the faeces of 18% of the piglets of 6 sows excreting the virus and 6% of those of 31 sows not excreting it. It was not recovered from the meconium of 33 new-born piglets and of 6 aborted foetuses. Of 31 piglets that died when less than 19 days old, only one yielded enterovirus, although 16 of 22 had antibodies in the serum. All of 8 gilts had neutralizing antibodies in the colostrum. The virus was recovered from the alimentary tract, particularly the terminal colon, but not from organs outside the alimentary tract of 6 pigs that were killed. No specific lesions were seen. It was also recovered from each of 9 batches of house-flies caught in the pig houses. Only 3 of 60 pigs up to one year of age lacked antibodies to the virus in the serum. A survey in Missouri revealed antibodies in 134 of 186 pigs in 38 of 41 farms. It was concluded that baby piglets are protected against the virus by antibodies in the colostrum, but later develop infection, when the virus multiplies in the lower alimentary tract and is excreted for about 2–3 months, during which period active immunity develops.—M.G.G.

Cirsteţ, I., Coman, I. & Feţeanu, A. (1960). Incercări de preparare a unui vaccin bivalent contra hepatitei contagioase canine şi a bolii lui Carre. **[Preparation of bivalent vaccine against canine virus hepatitis and distemper.]** — Lucr. Inst. Pat. Igienă anim., Bucureşti **10**, 87-95. [In Roumanian. Summaries in French and Russian.] **1488**

Hepatitis virus in tissue culture was inactivated by exposure to 56°C. for 10 min. or to ultra-violet light for 12 min. Egg-adapted distemper virus (diluted 1 in 10) was added to an equal volume of inactivated hepatitis virus. Dogs inoculated with 2 ml. of the mixture resisted 20,000 $TCID_{50}$ of live hepatitis virus injected 21 days later.—R.M.

Tournier, P., Brion, A., Fontaine, M., Fontaine, M. P. & Goret, P. (1960). Microscopie électronique de cultures de cellules rénales de chien infectées par le virus de Rubarth. **[Electron microscopy of dog kidney cells infected with canine hepatitis virus.]**—Bull. Acad. vét. Fr. **33**, 375-378. **1489**

Canine hepatitis virus in dog kidney cell cultures causes crescent-shaped intranuclear lesions at one or both poles of the nucleus, where numerous, rounded eosinophile particles, 57 mμ in diam., are distinguishable. While immunological data and particle size would warrant the inclusion of this virus in the adenovirus group the aspect of the nuclear

lesions differs from that described for human adenoviruses in electron microscopy.
—T.E.G.R.

Ablett, R. E. & Baker, L. A. (1960). **The development in the dog of naturally acquired antibody to canine virus hepatitis in relation to age.**—Vet. Rec. **72,** 1202. **1490**

Antibody neutralizing canine hepatitis virus was demonstrated in the serum of 2 of 15 puppies aged 6 weeks to 3 months, 17 of 22 puppies aged 3 to 6 months and 143 of 187 dogs over 6 months old.—M.G.G.

Girard, A. (1960). Recherches expérimentales sur la rhino-amygdalite contagieuse du chien. **[Experimental studies on contagious rhino-tonsillitis of dogs.]**—Thesis, Paris (Alfort) pp. 56. **1491**

This thesis provides details of experimental infection of dogs, serology, immunology and properties of the virus, supplementary to those already published [*V.B.* **30,** 3919].
—R.M.

Bowden, R. S. T., Hodgman, S. F. J. & Hart, C. F. (1960). **Some observations on the present mortality in wild foxes.** — J. Small Anim. Pract. **1,** 94-100. **1492**

Attention was first drawn to mortality among foxes, pigeons and pheasants in the Peterborough area in November 1959. Between then and May 1960, over 50 fox carcasses and over 20 specimens of viscera were examined. P.M. evidence indicates that the disease is hyperacute and the most common and outstanding finding is haemorrhage in the stomach and small intestine (sometimes with mucoid enteritis). This varies from extravasation of fresh blood to black tarry blood. Haemorrhages were also observed around the roots of the optic and oculomotor nerves, pituitary body, along the coronary vessels, in the epicardium (fairly frequently) and around the heart valves; congestion of the intracranial blood vessels was also observed. Lungs varied from normal to congested, pneumonia being generally absent; sometimes diffuse petechial haemorrhages were found. Liver lesions included congestion with mottling and, sometimes, centrilobular necrosis. Liver smears sometimes showed vacuolation of cytoplasm and haemosiderin deposits. Detailed histopathology is awaited. The pancreas was usually injected or haemorrhagic; the spleen and kidneys sometimes contained haemorrhages. Aetiology is obscure but a virus is suspected. Symptoms are blindness, circling and incoordinated movements and hyperaesthesia to sound. Transmission experiments gave negative results. In a note added in proof it is stated that the infective agent has been grown in tissue culture and further studies are in progress.—T.E.G.R.

Basse, A. (1961). Myxomatosis cuniculorum. **[Rabbit myxomatosis in Denmark.]** — Medlemsbl. danske Dyrlaegeforen. **44,** 61-66. [In Danish.] **1493**

Denmark had previously been free from naturally occurring myxomatosis, although local eradication of wild rabbits by means of the virus had been attempted on one of the islands in 1939. Six domestic rabbits from three holdings were received for examination in September and October 1960 and the results of P.M. and histological examinations and of experimental infection confirmed that the disease now occurs in Denmark. The findings are reported in detail.—F.E.W.

Lafenétre, H., Cortez, A., Rioux, J. A., Pages, A., Vollhardt, Y. & Quatrefages, H. (1960). Enzootie de tumeurs cutanées chez le lièvre. **[An outbreak of cutaneous tumours in hares.]** —Bull. Acad. vét. Fr. **33,** 379-389. **1494**

The outbreak occurred in the Mediterranean region of France among hares imported to replace rabbits which had been decimated by myxomatosis. The disease was first observed in spring (about 7 months after importation) involving over 60% of the hares without affecting their general state of health; it coincided with heavy mosquito infestation. Only carcasses or parts thereof were available for examination. The tumours (size of a pea and sometimes bigger) were unevenly distributed about the head, back, flanks and limbs. The disease was reproduced in one of 4 rabbits but transmission from rabbit to rabbit was not achieved. The tumours differ clinically from Shope's fibroma and from myxoma of rabbits. A virus, different from that of myxomatosis, is suspected as the causal agent.—T.E.G.R.

Keymer, I. F. (1961). **Newcastle disease in the jackdaw (Corvus monedula).**—Vet. Rec. **73,** 119-121 & 122. [Author's summary modified.] **1495**

The natural infection of a wild jackdaw with Newcastle disease, associated with an outbreak of the infection in poultry, is described. Circumstantial evidence suggested that jackdaws may have played a part in the spread of the disease.

Jackdaws which were fed infected embryonated fowls' eggs, had a significant antibody response of short duration. Unlike the wild bird, they showed no clinical signs of the disease and virus was not recovered from the internal organs.

Raggi, L. G. (1960). **Research note—a rapid macroscopic plate agglutination test for Newcastle disease—a preliminary report.**—Avian Diseases **4**, 320-323. **1496**

A plate agglutination test for antibodies against Newcastle disease (ND) is described which is more sensitive than the haemagglutination inhibition test. Antigen consists of a formolized saline suspension of ND virus obtained by twice ultracentrifuging chorioallantoic fluid from infected chick embryos. Each serum sample is centrifuged at 0°C. for 20 min. at 14,000 r.p.m. and a drop of the supernatant mixed on a glass plate with a loopful of antigen. After rotating the plate for 2–3 min., the test is read in a dark room by trans-illumination with a narrow beam microscope light.—A. Ackroyd.

Nobili, I., Guercio, V. & Demma, I. (1960). Il siero iperimmune ottenuto dal pollo nella profilassi e terapia della pseudo-peste aviare. **[Hyperimmune serum against Newcastle disease.]**—Vet. ital. **11**, 727-733. [Summaries in English, French and German.] **1497**

Hyperimmune serum, produced in fowls and treated with antibiotics, was used on fowls with Newcastle disease in 9 flocks. The dose varied from 0·3 to 3·0 ml. according to age and body weight. Mortality ceased 6–10 days after treatment and survival rate varied from 54–98%.—T.E.G.R.

Rusev, K. (1960). **[I. Attenuation of Newcastle disease virus by tissue culture. II. Propagation of Newcastle disease virus in rabbits.]**—Nauch. Trud. vet. Inst. Virusologiya, Sofia **2**, 65-74 & 75-79. [In Bulgarian. Summaries in English and Russian.] **1498**

Attempts were made to attenuate two strains of virus by passage in cultures of embryo cells from chicks, cattle or mice. Sufficient attenuation of the Burgas strain was achieved by alternate passage 56 times in chick-embryo cells plus 30 times in bovine kidney, while the Petleshkov strain was attenuated by 29 serial passages in bovine kidney. Advantages of cultivation in bovine kidney cell cultures for production of N.D. vaccine were discussed.

The Burgas strain became established in the abdominal cavity of rabbits only if it was inoculated i/p with chick embryo tissue. After 140 serial i/p passages the virus appeared to be suitable for immunizing chicks. Stability of the attenuated strain has not yet been confirmed.—R.M.

Mitev, G. & Gagov, I. (1960). I. Kultivierung des Pseudopestvirus auf neugeborenen Kaninchen. II. Immunisierung von Kücken und Hennen mit Trinkwasser-Pseudogeflügelpest-Vaccine. **[I. Cultivation of Newcastle disease virus in new-born rabbits. II. Immunization of chicks and hens with drinking-water vaccine against Newcastle disease.]**—Zbl. Bakt. I. (Orig.) **180**, 155-159 & 160-165. [Summaries in English, French, Spanish and Russian.] **1499**

I. Newcastle disease virus was adapted to serial intracerebral passage in newborn rabbits by preliminary alternate passages in chick embryos. After the 21st passage in rabbits it was no longer pathogenic for chickens but immunized them at a dose of 0·5 ml. i/m in 10^{-1} or 10^{-2} dilution.

II. In trials with 1,500 chickens, strain "F" of Newcastle disease virus in the drinking water gave immunity for up to 4 months. Immunity for a year was obtained by giving 4 doses of vaccine at intervals increasing from one to three months. Egg yield of 20,000 laying hens was not affected by immunization. —M.G.G.

Nilakantan, P. R., Ramachandran, S. P. & Dhanda, M. R. (1960). **Duration of immunity in fowls following vaccination with freeze dried Ranikhet (Newcastle) disease vaccine.** — Indian vet. J. **37**, 548-550. [Authors' summary modified.] **1500**

Challenge infection with virulent Newcastle disease virus of 213 fowls aged 2½ to 3½ years and haemagglutinin inhibition tests on samples of sera obtained from 519 fowls aged 1½ to 3½ years revealed that the immunity produced by the freeze dried Mukteswar strain of virus lasted practically throughout the birds' span of useful life.

Rahneberg, H.-U. (1960). I. Klinische und pathologisch-anatomische Befunde bei Hunden nach künstlicher Infektion mit dem Newcastlevirus. II. Hämatologische Befunde bei Welpen nach künstliche Infektion mit dem Newcastle-Virus. **[Clinical, pathological and haematological findings in dogs inocu-**

lated with Newcastle disease virus.]—Arch. exp. VetMed. **14**, 617-655 & 1025-1048. **1501**

The "Dessau" and "Italien" strains of N.D. virus were inoculated i/m, i/p, intracerebrally or orally into 33 puppies aged 8–16 weeks. Departure from normal health was only seen after i/c inoculation of the two strains (nervous symptoms), and i/m inj. of the "Dessau" strain (fever, inappetence). 304 incubated eggs were inoculated with organ suspensions or excreta from the dogs. Material from only 18 of the 33 dogs killed chick embryos, in most cases without formation of haemagglutinin. Specific antibodies were demonstrated by the H.I. test in serum taken between 5 and 40 days after i/c, i/m or i/p infection.

The only pathological changes encountered were attributed to circulatory disturbance. It was concluded that dogs were not naturally susceptible to the virus and could only occasionally transmit the virus passively.

Changes in the blood picture provided a good indication of the course of infection. Normal values for 17 healthy puppies are also given.—R.M.

Henle, W. (1960). **Persistent viral infections.** —Science **132**, 1493-1494. **1502**

In a study of latent virus infection MCN cultures [tissue cultures of human leucaemic bone marrow cells] were infected with Newcastle disease virus (NDV) and a few such infected cells were transferred to clean cultures. Only 1% of the cells in the latter cultures became infected and the remaining cells resisted superinfection. A component resembling interferon was produced which induced resistance. It was conjectured that, since the effect of interferon was transitory, interferon and virus are maintained in equilibrium, enabling both virus and cells to persist in culture.—J. H. Darbyshire.

Woernle, H. (1960). Ein Beitrag zur infektiösen Bronchitis der Hühner. [**Infectious bronchitis in fowls.**]—Mh. Tierheilk. **12**, 111-116. **1503**

The precipitation test in agar gel revealed no differences between German field strains of infectious bronchitis virus, Beaudette's egg-adapted strain, and strains of the Connecticut and Massachusetts types. The preparation of antigen and of specific immune serum for the test was described.—M.G.G.

Raggi, L. G. & Armstrong, W. H. (1960). **Conjunctivitis of chickens caused by a typical infectious laryngotracheitis virus.** — Avian Diseases **4**, 272-274. **1504**

In 1957, a haemorrhagic conjunctivitis caused heavy losses amongst chickens of all ages in South California. A virus isolated from the lacrimal fluid proved to be antigenically similar to a commercially available vaccine strain of infectious laryngotracheitis virus.—A. Ackroyd.

Chomiak, T. W., Luginbuhl, R. E. & Helmboldt, C. F. (1960). **Tissue culture and chicken embryo techniques for infectious laryngotracheitis virus studies.** — Avian Diseases **4**, 235-246. **1505**

In chick embryo kidney cell cultures, cytopathic effects were caused on first passage by 6 strains of infectious laryngotracheitis virus. Cells underwent granular degeneration into sharply limited masses. The 10th cell culture passage of one strain formed plaques to a titre of 10^5 plaque-forming units per ml., caused intranuclear inclusion bodies in chorio-allantoic membranes of chick embryos and proved infective when inoculated into the infraorbital sinus of chickens. A virus neutralization test by the cell culture plaque method was less sensitive than either the chick embryo allantoic sac or the chorio-allantoic membrane methods.—A. Ackroyd.

Klein, M. (1960). **Animal viruses and their relationship to diseases in man.** — J. Amer. vet. med. Ass. **137**, 670-674. **1506**

The proposition was made that viruses of animals, although capable of infecting man, do not cause epidemics in man, and viruses of man do not cause epizootics in animals lower than primates. However similar may be the antigenic structure and growth properties of a human virus and an animal virus, studies of cross-infection are essential before the possibility of their identity can be considered. —M.G.G.

Anon. (1960). **New ideas on epidemic virus infections.** — Lancet, November 19th, 1125-1126. **1507**

A discussion of the article by Hemmes *et al.* [*V.B.* **31**, 793]. It was suggested that their hypothesis be tested by studying the effect of relative humidity on other viruses. —M.G.G.

Alsop, J., Flewett, T. H. & Foster, J. R. (1960). **"Hand-foot-and-mouth disease" in Birmingham in 1959.** — Brit. med. J. December 10th, 1708-1711. [Authors' summary modified.] **1508**

An outbreak of a mild infection characterized by vesicular lesions in the mouth and on the hands and feet occurred in Birmingham in the summer of 1959; 83 cases were recorded, mostly in children. A few patients also had a maculo-papular rash on the buttocks. Coxsackie group A type 16 virus was isolated from vesicle fluid from the hands of one. There were no antibodies to foot and mouth disease virus in the two sera examined at Pirbright. A similar disease occurred in Toronto in 1957 [*Canad. med. Ass. J.* **79,** 615 (1958)].

Drozdov, G. G. (1960). **[The nature of milk-borne diphasic fever. III. Comparison of the virus with the viruses of tick-borne encephalitis, louping-ill and Omsk haemorrhagic fever.]**—Voprosy Virusologii **5,** 528-532. [In Russian. Summary in English.] **1509**

D. performed neutralization, complement fixation and cross-protection tests with the four viruses. The viruses were closely related, but the virus of milk-borne fever appeared to be a distinct entity.—R.M.

Basova, N. N., Chernikova, T. M., Suchkov, Y. G. & Rudnev, M. M. (1960). **[Q fever and psittacosis in wild birds.]** — Voprosy Virusologii **5,** 586-591. [In Russian. Summary in English.] **1510**

Q fever antibodies were detected in 51 of 354 sera from 22 species of birds; psittacosis antibodies were found in 23 of 275 sera. [An English translation will appear in *Problems of Virology* **5,** No. 6.]—R.M.

See also absts. **1545-1547** (transmissible tumours); **1549** (bovine leucosis); **1551** (adeno-like virus from avian lymphomatosis material); **1552** (avian visceral lymphomatosis); **1659** (report, Tanganyika); **1660** (report, Sarawak); **1663** (atlas of pathology of swine fever).

IMMUNITY

Boyden, S. V. (1960). **Antibody production.** —Nature, Lond. **185,** 724-727. **1511**

A new hypothesis of antibody production is described. The specialized antibody-forming cells of the body are coated with receptors with random affinities for a wide range of foreign molecules (antigens). These receptors are produced either by the antibody-forming cell before it reaches maturity or by another type of cell. If the former, all receptors with affinity for the body's own components are neutralized by the young antibody-forming cell itself, if the latter, they are removed from the body fluids before they contact the antibody-forming cells. The function of each antibody-forming cell is to produce γ-globulins of random specificities at an extremely high rate and to break these down again, excepting any which become fixed to an antigen entering the cell. The intracellular accumulation of γ-globulins to this antigen stimulates cell division and the formation of clones of cells which release the specific globulins into the circulation. The process is suggested to be an evolutionary development of the way in which the phagocytic cells of primitive Metazoa recognize foreign matter. —M.G.G.

Hayden, A. R. & Becker, E. L. (1960). **Antigen-antibody reactions in agar. V. precipitate density studies using the Oudin technique.**—J. Immunol. **85,** 591-602. **1512**

This paper describes for five protein antigen-rabbit antibody systems the effect of such factors as time of diffusion, antibody concentration and antigen concentration on the density of the leading edge of the precipitate. —R.M.

Jennings, R. K., Arditi, E. & Kaplan, M. A. (1960). **Gel diffusion studies of serologically related antigens. 1. Zone displacement in complex precipitating systems. 2. Patterns of partial identity. 3. Serological correspondence as a factor in zone displacement.**—Int. Arch. Allergy **17,** 257-266; 267-278 & 279-288. **1513**

(1) Two hypotheses concerning the phenomenon of zone displacement in complex precipitating systems were advanced. (2) Apparently pure antigens which elicit the formation of cross-reacting antibody might be a mixture of physically similar substances with differing antigenic properties, or they might combine with part of the precipitin to form a related but not identical antigen. (3) Antibody incapable of cross-reacting can enter into a readily reversible complex with cross-reacting antigen.—R.M.

Rose, N. R., Metzgar, R. S. & Witebsky, E. (1960). **Studies on organ specificity. XI. Isoantigens of rabbit pancreas.**—J. Immunol. **85,** 575-587. [Part of authors' introduction.] **1514**

There frequently appears to be a relationship between the presence of an organ-specific

antigen and the ability of the same organ extract to engender an autoantibody response under proper experimental conditions. The pancreas manifests organ-specific properties but of a variety more limited to species. Specific anti-pancreas antibodies provide little, if any, cross-reaction with pancreas extracts of other species. Therefore, experiments were undertaken to determine if rabbits immunized with extracts of pooled rabbit pancreas incorporated in Freund adjuvants would produce pancreas-specific autoantibodies and, if possible, to demonstrate histological changes in the pancreas resulting from this immunization.

Berk, R., Nelson, E. L. & Pickett, M. J. (1960). **Studies on mechanisms of cellular immunity. I. Observations on the metabolism of mouse monocytes. II. Observations on the interaction of Pseudomonas aeruginosa with various mammalian cells and fluids.** — J. infect. Dis. **107**, 175-182 & 183-188. **1515**

Mouse monocytes collected from peritoneal exudates induced by mineral oil exhibited increased oxygen consumption in the presence of succinate, pyruvate and p-phenylenediamine, but no other substrates. Succinic and cytochrome oxidase activity was dependent on supplements of cytochrome C. Phagocytosis *in vivo* of either living or dead *Pseudomonas pyocyanea* had no stimulating effect on monocytic succinoxidase activity nor was succinate oxidized intracellularly by living bacteria. Infected monocytes showed less succinoxidase activity than uninfected monocytes and a small net difference in lactic acid production was detected between phagocytizing and non-phagocytizing cells. Succinoxidase activity and lactate production from glucose were identical in uninfected monocytes from normal and immunized mice. The presence of living or dead monocytes from normal and immunized mice, serum, peritoneal washings, spleen homogenates and HeLa cells increased the oxygen consumption of *Ps. pyocyanea* but, conversely, the addition of killed bacteria to monocytes or HeLa cells inhibited endogenous and succinoxidase activities. Cytochrome oxidase was relatively unaffected. Cells from immunized mice were less sensitive to inhibition by pseudomonas than were those from normal mice.

—A. Ackroyd.

Podliachouk, L. & Queval, R. (1961). Les groupes sanguins des équidés du Tchad. **[Blood groups of horses and donkeys in Chad.]** — Ann. Inst. Pasteur **100**, 133-136. [English summary modified.] **1516**

In this preliminary study, blood samples from 59 local horses and 31 donkeys were examined. The distribution of red cell factors (A, C, D, E, F, H, J) in horses is not very different from that observed in France. A second blood group antigen, the "M" antigen, has been identified in donkeys by means of serological studies.

Osterhoff, D. R. (1960). **Blood groups in bovines. I. Production of cattle iso-immune sera and blood group reagents.** — Onderstepoort J. vet. Res. **28**, 479-491. [Author's abst.] **1517**

A short introduction to the field of bovine blood group research is given. Some of the terms used in immunogenetics are explained. The genetic aspects and the methods used are given briefly. The production of iso-immune sera is presented and the results shown. An analysis of the different sources of genetical and environmental variation in antibody production was made, from which it was concluded that it is impossible to give detailed directives for their production. The test difficulties under South African high temperature conditions are dealt with. It is concluded that these problems can only be solved by carrying out all blood work in an air-conditioned laboratory.

The fractionation of the different antisera is tabulated. Three new types of antibodies were isolated in the Africander breed which react with three unknown antigenic blood factors.

Through international co-operation, especially exchanges of test sera with other laboratories, the South African laboratory was able to start routine blood group determinations in 1958.

See also absts. **1319** (staphylococcal mastitis); **1328-1333** (TB.); **1344** (listeria agglutinins in dog blood); **1350** (puerperal E. coli sepsis in cows); **1364-1378** (brucellosis); **1387** (leptospirosis); **1393** (botulism vaccine); **1399** (aerosol vaccines against brucellosis, tularaemia, anthrax and plague); **1417** (soluble T. brucei antigen); **1431-1440** (F & M. disease); **1444-1446** (rabies); **1449** (sheep pox and goat pox); **1458** (African horse sickness vaccine); **1459-1461** (rinderpest); **1465** (bovine virus diarrhoea); **1478-1481** (swine fever); **1487** (enteroviruses of swine); **1488** (bivalent hepatitis-distemper vaccine); **1490** (canine virus hepatitis); **1496-1501** (Newcastle disease); **1539-1540** & **1544** (helminths).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Gibson, A. J. F., Sinclair, A. N. & Cavey, W. A. (1960). **Field trials on the application of various formulations of diazinon and dieldrin for the control of blowfly strike in sheep.**—Aust. vet. J. 36, 372-375. **1518**

The efficiency was compared of dieldrin, diazinon, diazinon with DDT, and diazinon with extra wetting agent, for the control of crutch and body strike. All were used at low concentrations to obtain an increased strike incidence. Dieldrin was ineffective owing to the presence of dieldrin-resistant flies. DDT did not increase the efficiency of diazinon, but the addition of extra wetting agent did. The insecticides were applied by "jetting" either the crutch only or the crutch and back. "Jetting" the back gave good protection against body strike but not crutch strike. "Jetting" the back with an ineffective insecticide increased the susceptibility to body strike.—N. P. H. Graham.

Briggs, J. D. (1960). **Reduction of adult house-fly emergence by the effects of Bacillus spp. on the development of immature forms.** —J. Insect Path. 2, 418-432. [Author's summary modified.] **1519**

A filtrable principle produced in nutrient-broth cultures of *Bacillus thuringiensis* interfered with the development of *Musca domestica* and reduced the number of adults issuing from a treated larval substrate. A similarly acting, but weaker principle was found in cultures of *Bacillus cereus*. Activity of the filtrable principle is retained in spore powders. Laboratory and commercially produced *B. thuringiensis* spore preparations retained activity in faeces of chickens receiving daily amounts in rations with and without chlortetracycline and sulphaquinoxaline. Addition of a *Bacillus thuringiensis* preparation to chicken feed stopped nearly all adult flies emerging when 3 g. were consumed daily by a laying hen.

No deleterious effects on the hens or on the quantity or quality of their eggs were noted.

Hall, W. T. K. & Wilkinson, P. R. (1960). **Observations on survival of cattle tick, Boophilus microplus (Can.) in north Queensland.**—Qd J. agric. Sci. 17, 91-96. [Authors' summary modified.] **1520**

Female ticks were placed in guinea grass tussocks on 14 occasions between July 1956 and July 1957, and weekly observations were made on the development of the eggs and on the survival of the larvae. The longest survival period from the collection of the parent females to the death of all larvae was 19 weeks. These ticks were put out in March. Egg development took from 3 weeks in summer to 10 weeks in winter. When the female ticks were flooded for 24 hours many of their eggs failed to hatch. The results are discussed in relation to tick control.

Stone, B. F. (1960). **The DDT-susceptibility of fourteen strains of the cattle tick, Boophilus microplus from northern New South Wales.**—Aust. vet. J. 36, 343-347. **1521**

A population of *B. microplus* survived an attempted eradication campaign in which all cattle had been dipped on 32 occasions over a 15 month period in 0·5% p,p'-DDT. Fourteen strains of ticks from the eradication area tested at the laboratory showed no evidence of DDT tolerance. Samples from three dipping vats were as toxic as freshly prepared samples of the same concentration.

—N. P. H. Graham.

McCarthy, P. H. (1960). **Observations on the infestation of the larger domestic animals and the kangaroo, by the ornate kangaroo tick (Amblyomma triguttatum).** — Aust. vet. J. 36, 436-437. **1522**

The distribution of *Amblyomma triguttatum* on the bodies of sheep, horses, cattle and kangaroos in the Barcaldine-Blackall area of Queensland is given.

—M. D. Murray.

McCarthy, P. H. (1960). **The presence of sarcoptic mange in the wild fox (Vulpes vulpes) in Central Queensland.**—Aust. vet. J. 36, 359-360. **1523**

Symptoms and incidence of the mange are described. One case is recorded of a horse becoming infested from the fresh pelt of a fox.—N. P. H. Graham.

McCarthy, P. H. (1960). **Transmission of sarcoptic mange from the wild fox (Vulpes vulpes) to man and other species in Central Queensland.**—Aust. vet. J. 36, 479-480. **1524**

Sarcoptes scabiei spp. were transmitted experimentally from mangy fox skin to man, and to a dingo pup. Domestic dogs, in contact with the dingo, became infested.—A. Culey.

McCreary, V. D. (1960). **Treatment of demodectic mange with ronnel (Ectoral). Clinical results in dogs.**—Allied Vet. **31**, 164-166. **1525**

Forty of 49 dogs with demodectic mange recovered completely after treatment with ronnel. The dogs were treated orally (50 mg./lb. every second day), topically (1% or 2% soln. over the entire body every 3 or 4 days), or by a combination of the two methods. Most recovered in 30 days.—M.G.G.

See also abst. **1425** (tsetse flies transmitting Besnoitia besnoiti).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Patnaik, B. (1960). **Treatment of fascioliasis.** —Indian vet. J. **37**, 561-569. **1526**

In 19 cattle treated with carbon tetrachloride and in 14 of 15 treated with hexachloroethane, the faeces became negative for eggs in 8–16 and 14–28 days, respectively. Carbon tetrachloride was administered s/c in liquid paraffin and had no apparent ill-effects. One emaciated bullock died 2 days after administration of hexachloroethane.

—R. N. Mohan.

Hovorka, J. (1960). Zur Frage der Saisonbedingtheit des Invasionsprozesses der Fasziolose in den Bedingungen der Tschechoslowakei. **[Seasonal character of the invasion process of fascioliasis in the conditions of Czechoslovakia.]**—Helminthologia **2**, No. 1. pp. 55-61. [In German. Summaries in English, French and Russian.] **1527**

H. considers the effect of seasonal and climatic factors on the life cycle of *Fasciola hepatica.* Output of eggs per mature fluke is at its highest in spring possibly owing to poor nutrition of the host.

The critical temperature for the development of fluke eggs lies between 8° and 12°C. The optimum temperature is between 18° and 30°C. Under natural conditions, in spring with a mean air temp. of 17·6°C. and in the autumn with a mean air temp. of 15·1°C. development took 56 days.

Development within *Limnaea truncatula* depends both on the temperature and on the age of the snail. In two series of observations in permanent habitats (springs) development took 373 days at a mean temp. of 9·4°C. H. stressed this in relation to the overwintering of the fluke in the snail. In temporary habitats development was complete in 122 days at a mean air temp. of 10°C.

The proportion of snails infected with *F. hepatica* is always small but reaches a maximum between August and October. Incidence of fasciola infection in sheep is at its lowest in July and rises until November.

—J. F. Michel.

Güralp, N. & Simms, B. T. (1960). **Bionomics of Fasciola gigantica in Turkey.**—Vet. Fak. Derg. **7**, 1-8. [In English. Summary in Turkish.] **1528**

F. gigantica was found in cattle livers at the Adana and Bursa abattoirs, in cattle and sheep livers at the Ankara abattoir, and in livers of sheep in two villages near Lake Apolyont. Flukes were not found in lambs under 8 months of age, and were collected only from the bile ducts and never from the gall bladder. The sizes of the ova were similar to those reported previously. *Limnaea auricularia* was found to be a snail host in Turkey; it occurs in western and southern Turkey and on the Anatolia Plateau up to 1,500 metres elevation. The cercariae emerging from *L. auricularia* were quite similar to those of *F. hepatica* but differed from them in behaviour. The encysted metacercariae produced were larger than those of *F. hepatica.* Rabbits and one lamb developed flukes in their livers after they were given metacercariae from *L. auricularia* which had been exposed to miracidia of *F. gigantica.*

—Brenda M. Wilson.

Ueno, H. & Watanabe, S. (1960). **[Ecological studies on the common liver fluke in Japan. I. Comparison of intermediate hosts of Japanese and English flukes.]** — Bull. Nat. Inst. Anim. Hlth, Tokyo No. 38 pp. 167-181. [In Japanese. Summary in English.] **1529**

Limnaea ollula is the only snail host of a liver fluke which has been identified in Japan as *Fasciola hepatica.* When miracidia from both this species and from *F. hepatica* in England were used to infect *L. ollula,* the snail was parasitized more readily by the Japanese fluke. A difference in the size of the metacercariae of the two flukes is also reported. The authors refrain from commenting on the validity of the identification of the Japanese fluke as *F. hepatica,* confining their comments to the difference in the snail host-parasite relationship.

—C. B. Ollerenshaw.

Euzéby, J. & Bussiéras, J. (1960). Tests thérapeutiques pratiqués dans le but d'améliorer le traitement des distomatoses hépatobiliaires des ruminants. **[Preliminary tests of phenanthroline-dione and diethylcarbamazine in sheep and cattle with mixed Fasciola and Dicrocoelium infestation.]** — Bull. Soc. Sci. vét. Lyon **62**, 231-239. **1530**

Five sheep with mixed *F. hepatica* and *D. dendriticum* infestation received a single oral dose of 0·1 g./kg. of diethylcarbamazine, and an infested calf was given 0·05 g./kg. daily for 3 days. The treatments were repeated 4 weeks later. Three sheep with mixed infestation received by mouth 0·2 g. of 4,7-phenanthroline-5,6-dione (Entobex) daily for 3 days, followed 3 weeks later by 1 g. daily for 3 days. Both drugs increased the excretion of ova by the 2 flukes. It was concluded that tests should be made with higher doses.

—M.G.G.

Güralp, N. (1960). **Present situation of schistosomiasis in Turkey.** — Acta trop., Basel **17**, 261-263. [In English.] **1531**

Schistosoma haematobium ova were present in urine sediment of 5 of 19 men examined in Turkey, but faeces and rectal mucosa samples from 268 sheep, 181 goats and 75 cattle were free from ova. Neither were adult worms present in the blood vessels of these animals. Water snails collected locally were free from the cercariae of the parasite.

—E.G.

Moore, D. V. & Connell, F. H. (1960). **Additional records of Dipylidium caninum infections in children in the United States with observations on treatment.**—Amer. J. trop. Med. Hyg. **9**, 604-605. **1532**

Proglottids were seen in faeces from four children aged between 2 and 4 years. In each case there was evidence of contact with dogs.

—R.M.

McCleery, E. F. & Wiggins, G. S. (1960). **A note on the occurrence of Cysticercus ovis in sheep derived from sources within the United Kingdom.**—Vet. Rec. **72**, 901-902 & 903. **1533**

A description is given of *Cysticercus ovis*. This is usually found in a state of degeneration. In the heart the cysts are mostly in the epicardium or endocardium with a few in the myocardium. Degenerated cysts in the heart tend to be filled with pus to a greater extent than those found elsewhere in the body. Cysts on the parietal portions of the diaphragm had a greater tendency to be calcified than those found elsewhere. In 1959 the incidence of infestation of sheep in Gt. Britain with *C. ovis* was approximately 0·2%. Little evidence was found as to the source of the infection or whether age affected the susceptibility to infection. When the cysts were not confined to the heart and diaphragm they were found dispersed throughout the carcass.

—Brenda M. Wilson.

Hutchison, W. F. & Bryan, M. W. (1960). **Studies on the hydatid worm, Echinococcus granulosus. I. Species identification of the parasite found in Mississippi. II. Prevalence in Mississippi.**—Amer. J. trop. Med. Hyg. **9**, 606-611 & 612-615. **1534**

Echinococcus cysts were found in 0·9% of 33,174 slaughtered pigs.—R.M.

Jurášek, V. & Breza, M. (1960). K otázke použitia organofosforových insekticídov (OFI) na dezinváziu vonkajšieho prostredia, špeciálne pri strongyloidózach. **[Effect of organic phosphorus insecticides on Strongyloides ransomi larvae.]** — Folia vet., Košice **4**, 261-269. [In Slovak. Summaries in English, German and Russian.] **1535**

The insecticide "phosphothion" (malathion) killed free-living larvae of *Strongyloides ransomi* in water and pig faeces. Rhabditiform, non-infective larvae were killed by a 0·1% soln. in 15–25 min., and by a 0·4% soln. in 5 min., infective filariform larvae by a 0·1% soln. in 25–35 min. and by a 0·4% soln. in 10–15 min. It was effective also against horse strongyle larvae of the first and second stage, but third-stage larvae were more resistant. "Phosphothion" at about 1 litre of 0·4% soln./sq. metre, applied to floors and walls, was recommended for the destruction of *S. ransomi* larvae in pigsties.—E.G.

Smit, J. D. (1960). **Capillaria hepatica infestation in a dog.** — Onderstepoort J. vet. Res. **28**, 473-478. [Author's abst.] **1536**

The macroscopic and microscopic lesions in a dog with *Capillaria hepatica* infestation are described. This is the first record in a dog in S. Africa.

Generalized calcification of the vascular system especially of the endocardium and major blood vessels was present and it is thought that the chronic capillaria infection in the liver predisposed the general tendency to calcification, as a reaction to hypersensitivity produced by the disintegrating worms.

A brief review of the literature is given.

In S. Africa this parasite has been recorded in rats, mice, rabbits, hares, meerkats, gerbils, hedgehogs and man.

Corticelli, B. & Lai, M. (1960). Variazioni nei conteggi delle uova di strongili gastro-intestinali, osservate in bovine in concomitanza del parto. **[Increase in the number of strongyle eggs in cows at parturition.]** — Veterinaria, Milano **9**, 292-296. [Summaries in English, French, German, Spanish and Portuguese.] **1537**

In 12 cows at pasture there was an increase in the faecal egg count at parturition. This finding is discussed.—T.E.G.R.

Swanson, L. E. & Wade, A. E. (1961). **Combination drug treatment for internal parasite infections of cattle.**—J. Amer. vet. med. Ass. **138**, 1-6. **1538**

Four groups of cattle comprising together 2 cows, 2 steers and 51 calves, were treated with a mixture of phenothiazine, piperazine citrate and hexachloroethane for the control of gastro-intestinal parasites and liver fluke. The mixture also contained salts of iron, copper and cobalt. The drench was made up in such a way that the dose rates (per 100 lb. body wt.) were: phenothiazine 10 g., hexachloroethane 10 g., piperazine base 7·1 g. A critical test on a single animal demonstrated that the mixture was efficient in the removal of *Haemonchus contortus, Oesophagostomum radiatum, Trichostrongylus axei, Cooperia* spp. and *Ostertagia ostertagi,* but there was little action against *Bunostomum phlebotomum.* The cattle in the main trial were given single or repeated doses at 21-day intervals and their faecal egg counts fell sharply after treatment. It was noteworthy, however, that adequately fed control cattle spontaneously eliminated their parasites during the period of observation without treatment even though grazed on heavily infected pastures. No advantage in weight gain was observed in the treated groups compared with the controls.—T. E. Gibson.

Christie, M. G. (1960). **Resistance to Trichostrongylus colubriformis produced by X-irradiated larvae.** — Vet. Rec. **72**, 992-993. **1539**

C. criticizes a letter from W. F. H. Jarrett *et al.* [*V.B.* **31**, 822] in which it is presumed that X-rays killed some *T. colubriformis* larvae so that the "vaccinated" animals received both viable and non-viable larvae. C. suggests rather that the animals had acquired some degree of immunity as a result of previous infestations. He also criticises the data presented to support the statement that the worms developing to the adult stage from X-irradiated larvae were largely "non-egg laying females".—Brenda M. Wilson.

Gordon, H. McL., Mulligan, W. & Reinecke, R. K. (1960). **Trichostrongylus colubriformis in the guinea pig. Studies with irradiated larvae.**—Aust. vet. J. **36**, 466-471. [Authors' summary modified.] **1540**

Infective larvae of *T. colubriformis* were treated with X-ray doses of 20,000, 40,000, 60,000 and 100,000 r. and administered to g.pigs which were killed 20 days later. Inactivation by X-ray was manifested by a reduction in the number of worms recovered P.M., the survival of more females than males, and a greatly reduced production of eggs.

The immunity stimulated by irradiated larvae was challenged 30 days later with 20,000 normal larvae. Controls were challenged at the same time, together with a small group of g.pigs which had been given a dose of normal larvae 30 days earlier. A strong immunity was observed in all groups which had received either irradiated or normal larvae.

Rose, J. H. (1960). **Teladorsagia davtiani Andreeva and Satubaldin, 1954, in British sheep.**—Vet. Rec. **72**, 1062. **1541**

The stomach worm *Teladorsagia davtiani* was recovered from lambs which had died from gastro-enteritis. All lambs had mixed infestations, *Ostertagia trifurcata, O. circumcincta* and *Trichostrongylus axei* in the abomasum and *T. vitrinus* in the small intestine. The males of *T. davtiani* and *O. trifurcata* cannot be distinguished by their spicules.—Brenda M. Wilson.

Symons, L. E. A. (1960). **Pathology of infestation of the rat with Nippostrongylus muris (Yokogawa). V. Protein digestion.**—Aust. J. biol. Sci. **13**, 578-583. [Author's summary modified.] **1542**

Protein digestion by infested rats was measured directly by feeding by stomach tube egg albumin labelled with radioiodine. One hour later nearly 70% was recovered from the gastro-intestinal tract of infested rats, as against 50% from controls. This difference was due largely to depression of digestion in the small intestine, although absorption was also slightly reduced. Gastric digestion was not affected.

Swietlikowski, M. (1960). W sprawie robaczycy płucnej bydła w Polsce. **[Lungworm disease of cattle in Poland.]**—Med. Wet., Warszawa **16**, 527-531. [In Polish. Summaries in English and Russian.] **1543**

An account on the occurrence of this condition which was little known in Poland before 1945. The epidemiology of outbreaks, diagnosis and control measures are discussed.
—M. Gitter.

Soulsby, E. J. L. (1960). **Immunity to helminths—recent advances.** — Vet. Rec. **72**, 322-328. **1544**

The importance of genetic resistance to disease is discussed. It is suggested that immunity may be acquired by the "self-cure mechanism" in other nematodes as well as *Haemonchus contortus*. This type of immunity is not very strictly specific, *e.g. H. contortus* larvae induce self-cure of other stomach worms as well as *H. contortus*. The elimination caused by this mechanism is probably due to some alteration in the mucosa which makes parasitism impossible, *e.g.* a reduction in oxygen tension. This is a local reaction and the mucosa of self-cured sheep shows a marked oedematous change with a superficial aggregation of eosinophiles. A significant rise in blood histamine has been noted at the time of self-cure, between the second and fourth day after the administration of the larvae. This suggests that the moulting of the larvae from the third to fourth stage in the abomasum initiated the self-cure. Associated with the self-cure mechanism is an antibody response which apparently plays no part in the cure as it is not suppressed by antihistamine drugs which suppress the self-cure. It is not yet known whether protection against re-infection, suppression of development to maturity or suppression of egg production of worms is due to one or many reactions. S. feels that the metabolic products of the parasites may be of some importance in immunizing the host, but are not the main source of "functional" antigen. Studies with *Ascaris lumbricoides* have indicated that the moulting period is one of the important times for the release of these antigens. In experiments with an X-irradiated vaccine for *H. contortus* it was found that immunity can be induced by a short period of larval development without the presence of adults. Over-irradiation of the larvae reduced the immunity.
—Brenda M. Wilson.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Dozza, G. & Torlone, V. (1960). Riproduzione sperimentale del tumore di Sticker con cellule tripsinizzate e con frazioni cellulari. **[Experimental reproduction of Sticker's sarcoma by inoculating trypsinized cells and cell fractions into dogs.]** — Vet. ital. **11**, 647-658. [Summaries in English, French and German.] **1545**

Transmissibility of Sticker's tumour was not affected by either trypsinization or fractionation. Integral cells, without any tissue components, caused a rapid development of the tumour whose size was in relation to the number of cells inoculated s/c; on the other hand, tumours were also produced by the various cell fractions (nuclear or cytoplasmic), though after a longer period. Since the cytoplasmic fraction did not contain integral cells it is doubtful whether this tumour should be classed as a graft tumour.
—T.E.G.R.

Burmester, B. R., Fontes, A. K. & Walter, W. G. (1960). **Contact transmission of Rous sarcoma.** — J. nat. Cancer Inst. **25**, 307-313. **1546**

Contact transmissibility of Rous sarcoma was proved in an experiment involving 820 inbred White Leghorns, a proportion of which developed either subcutaneous, muscular or visceral tumours when kept together with experimentally infected fowls. It was found that experimental transmission was possible by application of diluted virus into feather follicles.—E.G.

Rauscher, F. J. & Groupé, V. (1960). **Studies on noninfective tumor produced in turkeys by Rous sarcoma virus.** — J. nat. Cancer Inst. **25**, 141-159. **1547**

Tumours, produced in poults by relatively large doses of Rous sarcoma virus, yielded large amounts of virus 10–14 days after infection but little or no virus after 15 days. Serum antibody levels were low in birds with tumours containing large amounts of virus, and very high in those with virus-free tumours. Virus content varied in portions of

the same tumour. The inverse relationship between antibody levels and virus content and its association with the size of the initial infective dose and other factors, as yet unknown, were discussed.—E.G.

Anon. (1960). **Carcinogenicity and reactions of β-propiolactone.**—37th Ann. Rep. British Empire Cancer Campaign, 1959, Part II. pp. 371-373. **1548**

Only a single papilloma was observed in 25 mice treated twice weekly for 41 weeks with 0·3 ml. of a solution of acetone containing 2·5% β-propiolactone, much of which had probably hydrolysed to hydracrylic (β-hydroxypropionic) acid. No evidence of carcinogenicity was found in 21 mice painted twice weekly for 35 weeks with 0·3 ml. of 2·5% β-bromopropionic acid in acetone. Addition of β-propriolactone to a solution of plasma or egg albumen caused an immediate decrease in the total -SH plus -S-S- groups. It was suggested that β-propriolactone is carcinogenic on account of alkylation.—M.G.G.

Vasil'ev, N. T. (1960). **[Bovine leucosis.]**—Veterinariya, Moscow No. 12 pp. 19-24. [In Russian.] **1549**

The author examined for radio-activity organs and tissues from 7 cows with leucosis and 5 healthy cows. Samples weighing 30–50 g. were incinerated to the point of complete carbonization: the ash weighed 100–200 mg. Radio-activity (in terms of thousands of counts per min. per kg. of tissue) of liver, lymph nodes, spleen and bone averaged 49, 47, 40 and 41 in leucosis and 25, 4, 14 and 14 in healthy cows.

Leucosis was reproduced within 1 to 7 months after i/v inj. into 2 calves and by i/p inj. into mice of tissue emulsion from two cases. Abnormal white cell pictures were obtained in 11 calves born to infected cows. Clinical and haematological features of leucosis in cows are given. The author works at Novocherkassk zootechnical-veterinary institute.—R.M.

Møller, T. & Heje, N.-I. (1961). Plasmacelleleukaemi hos mink. **[Plasma-cell leucaemia in mink.]** — Medlemsbl. danske Dyrlaegeforen. **44,** 57-61. [In Danish.] **1550**

In the summer and autumn of 1959 about 50 deaths occurred in mink kits in a farm in Jutland. All mink in the farm were mutations. Although the same stock was used for breeding in the following season, the disease did not appear to have occurred there again up to mid-August. Further outbreaks have since occurred on three other farms in Jutland and one in Zealand, mainly in mutation mink but also in a few standard mink. In one farm in Jutland 700–800 deaths of mink aged 2–4 months occurred in June, July and August 1960. Of the 36 mink examined by the authors 21 were of the sapphire mutation. The P.M. findings agreed with those described by Obel [*V.B.* **30,** 223]. An ammoniacal odour was often noticeable on opening the ventricle. Histologically the disease was characterized by diffuse plasma-cell infiltration in the bone marrow red pulp, periportally in the liver, and in the renal cortex. In severe cases accumulations of plasma cells were seen in nearly all the organs. Paralymphoid deposits were demonstrable in 15 cases; these were sparse and present only in a single organ. Neither plasma-cell leucaemia nor the so-called "Aleutian disease" has previously been reported from Denmark in mink.—F.E.W.

Burmester, B. R., Sharpless, G. R. & Fontes, A. K. (1960). **Virus isolated from avian lymphomas unrelated to lymphomatosis virus.** — J. nat. Cancer Inst. **24,** 1443-1447. **1551**

A virus, provisionally named GAL (gallus adeno-like), antigenically unrelated to that of avian lymphomatosis, was isolated from lymphomatosis material. Morphologically it resembled adenovirus of man. [See also *V.B.* **30,** 3284.]—E.G.

Burmester, B. R., Fontes, A. K. & Walter, W. G. (1960). **Pathogenicity of a viral strain (RPL 12) causing avian visceral lymphomatosis and related neoplasms. III. Influence of host age and route of inoculation.**—J. nat. Cancer Inst. **24,** 1423-1442. **1552**

The authors studied influence of host age and route of infection on the pathogenic effect of the RPL 12 strain of avian visceral lymphomatosis virus, in 6,200 inbred White Leghorn chicks. Sensitivity to large i/v doses increased during the first 2–3 weeks of life, and then decreased until the age of 12 weeks. A more rapid decrease in sensitivity was observed after i/p infection. Sensitivity to small i/v doses, which produced visceral lymphomatosis, decreased at a similar rate. Sensitivity in chicks, given large oral and nasal doses, decreased rapidly for the first 2–3 weeks of life, after which decrease became more gradual. Certain batches of virus, when given

at the age of one day, resulted in high incidence of osteopetrosis. Incidence of osteopetrosis in chicks inoculated at the age of three weeks, was 10% of that in chicks inoculated when day-old.—E.G.

Horiuchi, T., Moriwaki, M. & Ishitani, R. (1960). **[Pathology of visceral lymphomatosis in fowls: changes in peripheral blood cells.]** —Jap. J. vet. Sci. **22**, 249-256. [In Japanese. Abst. from English summary.] **1553**

Blood smears from 64 fowls with visceral lymphomatosis were stained by one of 6 methods. Special attention was paid to round basophilic cells which contained granules. They were apparently immature myelocytes, and were present in 54 of the fowls. The authors called them G cells. Other basophile cells having large, round nuclei and no granules were seen in 14 of 18 cases, representing 10% of leucocytes. Polychromatic erythrocytes were common.—R.M.

See also abst. **1494** (cutaneous tumours in hares, caused by a virus differing from that of myxomatosis).

NUTRITIONAL AND METABOLIC DISORDERS

Hannan, J. (1960). **Nutrition and longevity.** —Irish vet. J. **14**, 176-181. **1554**

Certain foodstuffs may either protect animals from disease or weaken resistance, changes in diet can precipitate some diseases, and dietary deficiencies are responsible for losses in all species. Diets enriched with carbohydrate or protein have no adverse effect on life span, but high fat diets shorten the expectancy of life. There is considerable evidence that moderate dietary restriction has a beneficial effect on expectancy of life.

—E. J. Castle.

Widdowson, E. M., Dickerson, J. W. T. & McCance, R. A. (1960). **Severe undernutrition in growing and adult animals. 4. The impact of severe undernutrition on the chemical composition of the soft tissues of the pig.** —Brit. J. Nutr. **14**, 457-471. [Authors' summary modified.] **1555**

The chemical composition of muscle and other tissues of eight pigs has been examined after prolonged undernutrition during the suckling period. Muscle was also studied from four pigs whose growth was similarly retarded and which were then given plentiful food so that they gained weight rapidly.

The effects varied with (a) the age and size of the pigs, (b) the functional and anatomical maturity of tissue, (c) the growth priority of the tissue.

In muscle undernutrition reversed the normal process of chemical development; in some organs, *e.g.* the liver, it delayed maturation; in others, *e.g.* the skin and brain, both effects could be observed simultaneously. The gross composition of the kidneys was little changed.

McCance, R. A. & Mount, L. E. (1960). **Severe undernutrition in growing and adult animals. 5. Metabolic rate and body temperature in the pig.** — Brit. J. Nutr. **14**, 509-518. [Authors' summary modified.] **1556**

Young pigs were kept at weights of about 6 kg. for 12 months by undernutrition from early in lactation. They maintained thermal equilibrium at an ambient temperature of 24°C. They produced less heat in this environment and their deep body temperatures and skin temperatures were lower than those of normal animals of the same size. Their thermal insulation was about the same. In the earlier stages of undernutrition they produced much less heat than normal animals at 30°, but increased their production of heat considerably with a fall in the ambient temperature to 11°. After a year their heat production was nearer that of the controls at 30°, and their response to a fall in the ambient temperature was weak. Their blood-sugar concentrations were lower than normal.

Preston, T. R. (1960). **Calf rearing.** — Bull. Minist. Agric. Fish. & Food No. 10. pp. 31. [London: H.M. Stat. Off. 3s. 0d.] **1557**

This bulletin, now in its fourth edition, summarizes current knowledge and gives advice on the nutritive requirements, management, feeding, housing, and the common disorders of calves—white scour, nutritional scour, husk, parasitic gastritis, and bloat.

—M.G.G.

Bryant, M. P., Barrentine, B. F., Sykes, J. F., Robinson, I. M., Shawver, C. V. & Williams, L. W. (1960). **Predominant bacteria in the rumen of cattle on bloat-provoking Ladino clover pasture.** — J. Dairy Sci. **43**, 1435-1444. **1558**

The rumen bacteria were studied in six steers grazing bloat-provoking Ladino clover. Three of these animals were highly susceptible to bloat; they were spasmodically treated with 50 mg. oral procaine penicillin to prevent bloat

and studies were made before and 24 hours after treatment. There were no significant differences between groups in pH of rumen contents, counts of cellulolytic bacteria or total anaerobic bacteria, or in the occurrence of 11 bacterial groups. The only significant effect of the penicillin treatment was a depression in the numbers of facultative anaerobes. The mean anaerobic counts from the three susceptible steers were higher than in the others. The proportion of certain bacterial species cultivated from all the cattle grazing Ladino clover differed somewhat from those found in cattle on other diets.

—E. J. Castle.

Kochanov, N. E. (1959). **[I. Harmful influence of concentrate feeding on the health of high-yielding cows in their second, third and fourth lactations. II. Disturbances of the cardiovascular system associated with feeding concentrates to high-yielding cows.]**—Trud. Mosk. Vet. Akad. **25**, 32-41 & 108-114. [In Russian. Summaries in English.] **1559**

Thirty-one Kholmogor cows were given for a year (October to October) 370 g. of concentrates for every kg. of milk yielded. The nature of the concentrates was not stated. Small amounts of hay and silage were also provided. Average annual milk yield was 4,450 kg. a head. During winter housing cows were exercised for 3–4 hours daily before and after milking. Troubles attributed to the diet were loss of condition, dyspnoea, enlargement of liver, indigestion, infertility, painful bones and softening of caudal vertebrae, changes in composition of blood and urine, and changes in heart function attributed to myocardial dystrophy.—R.M.

Krogh, N. (1960). **Studies on alterations in the rumen fluid of sheep, especially concerning the microbial composition, when readily available carbohydrates are added to the food. II. Lactose.**—Acta vet. scand. **1**, 383-410. [In English. Summaries in German and Norwegian. English summary modified.] **1560**

Feeding lactose in excess to hay-fed sheep led to acute acid indigestion with profound changes in the microbial flora, pH and physical properties of the rumen fluid. Amylolytic streptococci increased transiently, then lactobacilli multiplied rapidly with depression and destruction of the normal rumen flora and fauna. The acute indigestion was related to the lactobacillosis of the rumen.

Parallel experiments with sucrose led to indigestion with similar alterations in the rumen fluid, but the tolerance for lactose was somewhat higher. Variations in tolerance for lactose and for sucrose seemed to be related to the consumption of hay and water and to the amount of protozoa.

Neutralizing the rumen contents by sodium bicarbonate usually aggravated the clinical condition.

Coles, B. L. (1960). **Effect of a low-protein diet on the serum proteins of kittens.**—Brit. J. Nutr. **14**, 419-424. [Author's summary.] **1561**

The serum-protein pattern in three litters of kittens on a diet with 20% protein was studied for 6–8 weeks. All kittens were 10 weeks old when they first received the diet and had been weaned on to the normal colony stock diet (50% protein). Two litters were then given the stock diet for 8–10 weeks and the changes with recovery were studied. The protein pattern and body-weight were compared with those of normal colony kittens of similar age.

All litters lost weight rapidly during the first 2 weeks on the experimental diet. One litter then gained slowly, the other litters continued to lose at a slower rate. After refeeding with stock diet all kittens rapidly regained weight.

An abnormal protein fraction appeared in the serum during the low-protein feeding and its significance is discussed.

One litter developed infection during the recovery period. These kittens showed a steep fall in serum γ-globulin content during their illness. This abnormal response to infection is attributed to previous protein depletion.

Havre, G. N., Dynna, O. & Ender, F. (1960). **The occurrence of conditioned and simple copper deficiency in cattle and sheep in Setesdalen, a valley in the southern part of Norway.**—Acta vet. scand. **1**, 250-276. [In English. Summaries in German and Norwegian.] **1562**

An account is given of conditioned copper deficiency in 40 cattle and simple deficiency in 10. The former type occurred in various parts while the latter was restricted to one district. Spectrographic analysis of grass, hay and soil from conditioned deficiency and simple deficiency areas, respectively, revealed: molybdenum content, up to 17 p.p.m. and 3 p.p.m.; copper 6·6 p.p.m. and 5·5 p.p.m. There was good agreement between analytical results and clinical observations. In both types of deficiency symptoms were inappetence,

unthriftiness, diminished milk yield, and depigmentation of the hair, particularly about the face and neck. Marked diminution of Hb values was not a constant finding. Skeletal changes did not occur. Swayback and other conditions ascribable to copper deficiency in sheep were also observed. Results of treatment with copper sulphate, orally or i/v, are discussed and details are given of sampling technique and analytical methods used.

—T.E.G.R.

Barlow, R. M., Purves, D., Butler, E. J. & Macintyre, I. J. (1960). **Swayback in south-east Scotland. I. Field aspects. II. Clinical, pathological and biochemical aspects.**—J. comp. Path. **70**, 396-410 & 411-428. **1563**

I & II. There are differences between swayback in Gt. Britain and the similar disease, enzootic ataxia in Australia. During 1956–58, the epidemiology, pathology and biochemistry of swayback in south-eastern Scotland were investigated. The disease was diagnosed in various breeds of lamb on 18 farms on various geological formations, the incidence varying from 1–50%. Analysis of herbage (uncontaminated with soil) from representative pastures suggested that there may have been a dietary deficiency of copper in the ewes. Most samples had a copper content of less than 5 p.p.m. dry wt. which is similar to that of Australian pastures associated with enzootic ataxia. Soil contamination of herbage which may not be evident to the naked eye can give erroneously high copper values. It is essential to eliminate such samples, and this was done by comparing the copper and titanium contents of the herbage. Though the disease does not appear to constitute a serious economic problem in Scotland, in some years an increased incidence may occur associated with the improvement of marginal grassland resulting in an early abundant growth of pasture of relatively low copper content. Clinically the appearance of the affected lambs was similar to that described for swayback. Macroscopically only 30·5% of the 79 lambs examined showed cerebral lesions and all these were congenital cases. Pathognomonic microscopic lesions were found in the brain stem and spinal cord of all cases but in the cerebrum of only 59·9% which strongly indicates that the latter lesions are not primary. Estimates of the copper content of blood and liver spectrophotometrically by a dithizone method revealed very low values in affected lambs and their mothers and were similar to those associated with enzootic ataxia. Considerably higher values have previously been reported in Britain. No correlation was observed between the copper status and severity of clinical manifestations or nerve lesions after the disease had appeared. Comparative studies on foetal and normal new-born lambs suggested that the primary lesions caused an inhibition of development of nerve cells, myelin sheaths and glia rather than a demyelination as has been previously suggested. The ataxia may be due to delayed responses to extero- and proprioreceptive impulses rather than to spastic paralysis.—A. Ackroyd.

Dymko, E. F. (1959). **[Influence of cobalt and copper on metabolism in sheep.]** — Trudy Alma-Atinsk. zoovet. Inst. **11**, 328-341. [In Russian.] **1564**

Cobalt chloride (10 mg. daily by mouth for 5 days) accelerated metabolic reactions as manifested by increase in the reserves of alkali, glutathione, sugar, haemoglobin and total protein in blood, and blood cell counts. Cobalt, as well as copper (50 mg. by mouth as copper sulphate soln., once every 5 days on six occasions) increased the phagocytic activity of leucocytes. Cobalt caused a "regenerative shift" of neutrophiles towards unsegmented types, and increased the numbers of monocytes and eosinophiles.

Copper sulphate increased blood glutathione, serum albumin, haemoglobin, polymorphs, eosinophiles and monocytes. D. suggested that cobalt and copper should increase the resistance of sheep to disease.

—R.M.

Ashton, W. M. & Sinclair, K. B. (1960). **Blood serum calcium and magnesium levels in bullocks grazing simple leys and old pastures.** —J. Brit. Grassl. Soc. **15**, 296-299. **1565**

From April to June, 6 bullocks grazed plots sown 5 years previously to ryegrass or tall fescue, with white clover in each case, and from June to September they grazed old pastures. The average Mg content of the serum was higher when the animals grazed ley pasture than when they grazed old pasture, and was higher on tall fescue than on ryegrass. But dry matter of herbage from the old pastures had a higher Mg content than that of herbage from the leys. The herbage on the old pastures was sparse and affected by drought, whereas it was abundant on the ley plots. The Ca content of the serum was not affected significantly.—M.G.G.

Todd, J. R. & Thompson, R. H. (1960). **Major blood electrolyte concentrations in cattle during the development of hypomagnesaemia.** —Brit. vet. J. **116**, 437-442. [Authors' summary.] **1566**

Blood serum or plasma was analysed (a) from cows developing hypomagnesaemia (without clinical symptoms) on going out to pasture in spring, and (b) from calves developing hypomagnesaemia on low-magnesium milk rations. The analyses included serum magnesium and calcium and plasma sodium, potassium, chloride and carbon dioxide combining power. There were no consistent alterations in the concentrations of any of the other electrolytes consequent upon severe hypomagnesaemia.

Kashiwa, H. K. (1961). **Magnesium deficiency in intact, in adrenalectomized and in hypophysectomized rats.**—Endocrinology **68**, 80-91. [Author's abst. modified.] **1567**

Control and magnesium-deficient synthetic diets were fed to intact, to adrenalectomized and to hypophysectomized male rats for 8, 15 and 22 days. The course and sequence of magnesium-deficiency symptoms were recorded. In intact and in adrenalectomized rats fed the deficient diet, growth rate was depressed, whereas hypophysectomized, deficient rats showed little difference in weight gain compared to their controls.

Rats in each group on the deficient diet developed hyperaemia of the ears, leucocytosis (especially eosinophilia) and renal lesions in the distal convoluted tabules coincident with the initial depletion of serum Mg. In intact and adrenalectomized rats these symptoms appeared during the first week, but in hypophysectomized rats the onset was delayed to the third week.

Although the kidney lesions were similar to those described for potassium-deficient rats, they appeared to be due to magnesium deficiency. The data also suggested a possible pituitary-kidney axis for the control of serum Mg.

Polidori, F. (1960). Problemi di alimentazione dei suinetti. 2. Influenza della somministrazione per via intramuscolare di ferro-destrano sul tasso emoglobinico del sangue e sullo sviluppo corporeo. **[Effect of iron dextran on haemoglobin level and growth of new-born pigs.]**—Zootec. e Vet. **15**, 198-202. [Summary in English.] **1568**

Five piglets aged 4 days were each given an i/m injection of 2 ml. iron-dextran soln. (150 mg. Fe) and, with 5 untreated controls, kept under observation until weaning. In treated pigs the fall in Hb which occurs at birth was stopped and levels exceeded normal especially at 10–14 days (while in untreated pigs there was a marked diminution). At 21 days there was a slight decrease, the level stabilizing at about 9 g. while in controls it reached minimum values and thereafter gradually rose until it reached normal values after 5 weeks. Weight gains were higher, especially at the 10th day, than in controls.

—T.E.G.R.

Buziassy, C. & Tribe, D. E. (1960). **The synthesis of vitamins in the rumen of sheep. I. The effect of diet on the synthesis of thiamine, riboflavin and nicotinic acid. II. Levels of thiamine, riboflavin and nicotinic acid in the rumen of grazing lambs.** — Aust. J. agric. Res. **11**, 989-1001 & 1002-1008. **1569**

I. The levels of thiamine, riboflavin, and nicotinic acid in the rumen of sheep fed a variety of diets were determined by chemical methods. The intakes of dry matter, B vitamins, protein, non-protein nitrogen, and energy were recorded, and the rumen volumes on each diet were estimated. The diets were mainly of a semi-synthetic type, (sodium hydroxide-treated straw supplemented with varying amounts of casein, urea starch, sugar, and minerals).

When the intake of the B vitamins was high, little microbial synthesis took place in the rumen. However, when the diet was deficient in the B vitamins synthesis was high.

There was no apparent relationship between the levels of the vitamins in the food and in the rumen liquid. However, a relationship between the nitrogen intake and the vitamin levels in the rumen was found, the relationship being marked when widely differing levels of B vitamin were fed.

The total substitution of the dietary protein (casein) by non-protein nitrogen (urea) did not influence the synthesis of thiamine and riboflavin but did depress the synthesis of nicotinic acid.

II. Levels of these B vitamins were measured in ewes' milk and herbage, and in the rumen contents of young lambs being reared on these foods. The vitamin levels in the rumen contents increased sharply during the first 3 weeks of life but thereafter showed no change up to 9½ weeks of age. The lambs were weaned at 8 weeks of age, and after weaning there was less variability in the rumen

levels of all vitamins, and the levels of nicotinic acid were lower than before.

These observations are discussed in relation to microbial synthesis of vitamins in the rumen of unweaned lambs.

Schubert, J. R., Muth, O. H., Oldfield, J. E. & Remmert, L. F. (1960). **Enhanced 5-nucleotidase activity associated with white muscle disease.**—Proc. Soc. exp. Biol., N.Y. **104,** 568-569. **1570**

Nine lambs with white muscle disease and 10 normal lambs were killed at the age of 2–6 weeks, and their twins at the age of a few days. The muscle of affected lambs contained about 6 times more 5-nucleotidase than that of normal lambs. But there was little difference in the 5-nucleotidase content of the muscle between the twins of the affected and normal lambs.—M.G.G.

Flux, D. S., Butler, G. W., Rae, A. L. & Brougham, R. W. (1960). **Relationship between levels of iodine and cyanogenetic glucoside in pasture and the productive performance of sheep.**—J. agric. Sci. **55,** 191-196. **1571**

Ewe lambs were grazed for 19 months on one of four pastures, perennial rye-grass and short rotation rye-grass, both with and without cyanogenetic white clover. Half the animals in each group were injected i/m with iodinated poppy-seed oil to serve as an iodine depot. The ewes lambed during this period and were slaughtered at the end of the 19 months and the lambs were slaughtered when they weighed about 70 lb. During the experiment and after slaughter the following data were recorded, body weight at monthly intervals (ewes and lambs), weight of greasy wool at shearing, number and birth-weight of lambs, serum iodine level and weight and iodine content of thyroid glands of ewes and lambs.

The increased weight of the thyroid glands of non-injected ewes and their lambs grazing the short-rotation rye-grass and white clover and to a lesser extent those grazing the perennial rye-grass and white clover, indicated a goitrogenic action, and there was evidence of slight goitrogenic activity in the perennial rye-grass alone. The iodine content of the serum and thyroid glands was considerably greater in injected ewes, and their thyroids were of normal weight. The iodine supplementation had no effect on growth, reproduction or wool production.

—E. J. Castle.

Pedini, B. (1960). Il diabete mellito nel bovino. (Cenni sulla fisiopatologia e sulla ezio-patogenesi del diabete mellito. Rassegna bibliografica ed osservazioni personali nel bovino). **[Diabetes mellitus in cattle.]**—Vet. ital. **11,** 739-798. [Summaries in English, French and German.] **1572**

Diabetes mellitus in cattle is discussed, relevant literature is reviewed and an account is given of the disease in 2 calves.—T.E.G.R.

Smith, E. E. (1960). **Oxidation of volatile fatty acids as related to ketosis in ruminants.** —Dissertation, Purdue pp. 63. [Abst. from Diss. Abstr. **21,** 42-43.] **1573**

Warburg respiration and incubation studies were carried out with rumen epithelium and liver slices obtained simultaneously by surgical biopsy from fasted normal ewes and fasted ewes with ketosis. Acetate, propionate, and butyrate contents of the tissues were compared. The amount of volatile fatty acid used by the tissue and the amount of ketone bodies produced were measured. Rumen epithelium and liver were analysed for total nitrogen in each experiment and total liver lipid was also determined.

Results indicated no inherent deficiency for the oxidation of acetate, propionate, and butyrate in the ruminant ketotic liver. Increased acetoacetate production by the ketotic liver illustrated its importance as a major site of ketone body production in ruminant ketosis. Rumen epithelium from both normal fasted sheep and from fasted sheep with ketosis had a high potential for ketone body formation in the presence or absence of substrate.

DISEASES, GENERAL

Leech, F. B., Davis, M. E., Macrae, W. D. & Withers, F. W. (1960). **Disease, wastage and husbandry in the British dairy herd. Report of a National Survey in 1957-58.** pp. 62. London: H.M. Stat. Office. **1574**

This Ministry of Agriculture survey covers management, production, disease, culling and mortality during a period of 12 months (1957/58) in 1,158 dairy herds containing about 31,000 cows in England, Scotland and Wales.

The estimated incidence of disease,

expressed as the number of cows affected and the percentage of cows affected to those at risk, is detailed in a table on pages 27 and 28. The more common diseases were: mastitis 9·9 (% of the cow population affected in one year), retained placenta 3·87, milk fever 3·54, undiagnosed infertility 3, foul-in-the-foot 2·8, abortion 2, acetonaemia 1·9, difficult calving 1·78. The proportion of cows with undiagnosed illness was put at 0·15%.

Economically, the most important diseases together with figures representing total depreciation in market value of cows affected during a year, were mastitis (£540,000), Johne's disease (£626,000), injuries and accidents (£520,000) and trouble at calving (£316,000).

A feature characteristic of most diseases was that a few herds were affected severely and the remainder slightly or not at all. This held not only for infectious diseases, but also for metabolic disorders and bloat. Abortion and stillbirth was commoner in Guernsey and Jersey cows than in other breeds. The authors suggested that there should be further investigation into the higher incidence of stillbirths in autumn and winter; the similar regional incidence of ketosis and grass tetany; the seasonal curve of abortion and its relationship to excretion of brucella by apparently healthy cows at the time of calving.

The report contains maps which show areas covered by the survey, average herd size, the pattern of winter housing, and the distribution of redwater (piroplasmosis). It costs 4 shillings.—M.G.G.

Brown, D. H., McIntyre, R. W., Delli Quadri, C. A. & Schroeder, R. J. (1960). **Health problems of captive dolphins and seals.**—J. Amer. vet. med. Ass. **137**, 534-538. **1575**

This paper describes the conditions found in several species of dolphins and seals in captivity in California.

At first the mortality in newly-captured dolphins was high on account of injuries inflicted during capture. This was overcome by use of more humane methods.

Amongst seals and sea-lions little trouble was experienced, mortality being mostly confined to unweaned animals. Pediculosis caused by *Echinophthirius horridus* caused some trouble and appropriate treatment is described. One seal died and four others had to be destroyed because of infection by *Filaria* sp. in the right heart and pulmonary artery. This infection was associated with bronchitis and coughing, which failed to respond to antibiotic treatment.

One Pacific bottle-nosed dolphin refused food on capture and became so weak that it could not swim and floated on the surface of the tank. This resulted in acute sunburn. The dolphin was induced to feed and made a complete recovery. Eleven months later, however, it again refused to feed and died of cachexia.

One Atlantic bottle-nosed dolphin died from fluke infestation *(Zalophotrema hepaticum)* and another as a result of infection with *Salmonella typhi-murium.*

One striped dolphin died from starvation following massive gastric impaction. Seven cotton gloves belonging to the attendants were recovered from the first and second stomach compartments, and completely blocked the pylorus to oesophageal opening. Experience showed that it was most important to keep foreign objects from the tanks because many dolphins developed depraved appetites.

Another of this species died of purulent pneumonia and septicaemia, which appeared to arise as a result of injury from which a skin abscess developed. Coagulase-positive staphylococci were recovered from the abscesses.—R. N. Fiennes.

Kleĭnbok, M. T. (1959). **[Pathology of the intramural nervous apparatus of stomach and intestine of horses with obstruction of the large intestine.]** — Trudy Alma-Atinsk. zoovet. Inst. **11**, 356-376. [In Russian.] **1576**

K. examined the digestive tract of 8 horses that died of volvulus, diaphragmatic hernia or coprostasis. Similar degenerative lesions in the intramural ganglia were observed anterior and posterior to the obstruction and in the stomach. Amitotic division of neurones was also seen. There are 26 photomicrographs.—R.M.

I. Faddeev, L. A., Panysheva, L. V. & Polyakin, V. V. (1959). **[Dystony of the forestomachs in cattle.]**—Trud. Mosk. Vet. Akad. **24**, Pt. 2 pp. 3-13. **1577**

II. Kotov, S. S. (1959). **[Morphology and biochemistry of blood in normal cows and cows with atony of the forestomachs.]**—Ibid. pp. 27-40. **1578**

III. Cherkasov, V. A. (1959). **[Changes in the infusorial fauna of the forestomachs of cattle with ruminal atony.]**—Ibid. pp. 131-142. [In Russian. Summaries in English.] **1579**

I. The term dystony was used to mean

variations from the normal in the motor activity of the forestomachs. Possible causes are classified on a chart.

II. Atony not of traumatic origin was associated, in the initial stages, with a fall in chloride content and alkaline reserves of the blood, which suggested that one of the causal factors was prolonged deficiency of minerals in the ration.

III. Addition of concentrates to a hay ration caused a decrease in the numbers of rumen infusoria, especially members of the ophrixolecid family. During the first day of primary atony of alimentary origin, the numbers of *Diplodinium* and *Entodinium* decreased while the numbers of ophrixolecids increased. On the second and third days the total infusoria population decreased and was largely made up of encysted forms. The last organism to disappear, and the first to start multiplying upon recovery, was *Epidinium caudatum.*

During secondary atony (accompanying disease elsewhere in the body) there were no qualitative or quantitative changes in the rumen infusoria.—R.M.

Postnikov, V. S. (1959). **[I. Liver function tests in cattle with atony of the forestomachs. II. Colloidal tests for liver function in cattle with liver disease. III. Colloidal tests for liver function in cattle with traumatic reticulitis and pericarditis.]**—Trud. Mosk. Vet. Akad. **24,** Pt. 2 pp. 41-47; 48-51 & 52-55. [In Russian. Summary in English.] **1580**

Acute primary atony did not appear to affect liver function, but secondary atony was often accompanied by positive colloidal tests, increased bilirubin in the blood and decreased prothrombin in plasma. The formol gel, cadmium sulphate, Takata-Ara and Weltmann's colloidal tests were regarded as fairly reliable indicators of liver disease in 26 cows. They gave weakly positive reactions in cases of acute traumatic reticulitis and more strongly positive reactions (except Weltmann's test) in purulent pericarditis.—R.M.

Peredereev, N. I. (1959). **[Deamination of intravenously injected glycine as a test for liver function in cows and for diagnosis of metabolic disorders.]** — Trud. Mosk. Vet. Akad. **25,** 98-107. [In Russian. Summary in English.] **1581**

Pure glycine was inj. i/v at 0·015 or 0·045 g./kg. body wt. in 10% soln. Blood was collected from the mammary vein of 6 healthy and 10 sick cows before injection and 5, 15, 30, 60 and 120 min. afterwards and total amino-acids were determined by the method of Cocking & Yemm (1954), while individual amino-acids were determined by paper chromatography. Metabolic disturbance (ketosis) was accompanied by higher amino-acid values than in healthy cows. For practical use the 0·045 g./kg. dosage was recommended; collection of blood at 120 min. could be omitted.—R.M.

Moroshkin, B. F., Ivanskii, E. F. & Kostina, A. O. (1959). **[Blood sedimentation and erythrocyte resistance in bovine chronic haematuria.]** — Nauk. Pratsi L'viv. zoovet. Inst. **10,** 149-155. [In Ukrainian. Summary in Russian.] **1582**

Sedimentation rate and erythrocyte resistance were used to detect anaemia in cows with haematuria. In the same volume of collected works from L'vov zootechnical-veterinary institute there are 6 other papers on chronic haematuria, including electrocardiography, lesions in the intramural ganglia of the bladder, pathogenesis, spectroscopic analysis of soil, water and other materials. There was no further development of the theory of radio-activity suggested by Moroshkin [*V.B.* **29,** 3255]. Incidence of the disease was unrelated to calcium content of soil and plants.—R.M.

Karlsson, K. A. (1960). **Intestinal stenosis in chicks—a sequela to invagination.**—Acta vet. scand. **1,** 236-244. [In English. Summaries in German and Swedish. Author's summary modified.] **1583**

The author gave an account of a well-defined, though not frequent, disease in chickens, characterized by a collar-like cicatricial stenosis in the small intestine which develops as a sequela of intestinal invagination after demarcation and sloughing of the intussusceptum. In some 50,000 P.M. examinations of fowls 123 cases of intestinal invagination were found, 76 of which were chronic with sloughing of the intussusceptum and cicatricial stenosis.

Lengemann, F. W. (1960). **The effect of whole-body X-irradiation on the absorption of calcium-45 and strontium-85 from the intestinal tract of the rat.**—Radiation Res. **13,** 892-897. [Author's summary modified.] **1584**

Young and mature male albino rats were subjected to whole-body X-irradiation to determine whether the absorption of radio-

strontium and radiocalcium could be altered by such a procedure.

The data showed that 200 r significantly increased the amount of Sr^{85} and Ca^{45} crossing the intestine of the young rat, but in the mature rat 1000 r and 400 r were needed to increase the passage of Sr^{85} and Ca^{45}, respectively.

The irradiation did not appear to alter the uptake of the radionuclides by bone, and it was concluded that the defect was produced at the intestinal level. The increased absorption of radiostrontium and radiocalcium was evident as early as 2 hours and as long as 48 hours after irradiation. Feeding and/or fasting the animals before and after irradiation had no effect on the results.

Hackett, P. L., Galbraith, T. A., Bennett, C. A. & Bustad, L. K. (1960). **Changes in blood constituents in sheep following prolonged daily administration of iodine^{131}.**—Amer. J. vet. Res. **21**, 775-781. [Authors' summary modified.] **1585**

The prolonged daily administration of 1,800, 240, 135, 45, 15 and 5 μc of iodine^{131} produced haematological values differing from control levels. In adult ewes, a decrease in protein-bound iodine values was the first change in a blood constituent due to I^{131} feeding at all levels except 5 μc. Next, creatinine values increased in all sheep except those fed 15 and 5 μc per day. In sheep maintained on I^{131} for an extended period, depression in the leucocyte count was observed at the 1,800, 240, 135 and 5 μc per day level; however, in sheep given 5 μc, the depression was slight and did not appear until four years after I^{131} feeding was initiated. Generally, the time of appearance of changes in blood constituents was shortened with increasing dose levels and by initiating exposure at an earlier age. Animals exposed to I^{131} *in utero* and during early life, also had decreased r.b.c. count, decreased glucose and calcium levels, and increased non-protein nitrogen and phosphorus values after a daily dosage of 240 μc (which was the highest dosage compatible with significant numbers of viable offspring).

Pinus, A. A. (1960). [**Histopathological lesions in the organs of rats after oral administration of radiosodium.**]—Arkh. Pat. No. 10 pp. 47-49. [In Russian. Summary in English.] **1586**

Radiosodium was given as NaCl or Na_2CO_3. Doses of 30–40 microcuries of Na^{24} per g. body wt. caused typical radiation sickness with striking degeneration of the testicles accompanied by multinucleate giant cells in the seminiferous tubules. Doses of 12–20 microcuries/g. also caused these lesions but were not always lethal.—R.M.

POISONS AND POISONING

Oliver, W. T. & Platonow, N. (1960). **Studies on the pharmacology of N-(ethylmercuri)-p-toluenesulfonanilide.** — Amer. J. vet. Res. **21**, 906-916. **1587**

This organic mercury compound is used as a seed dressing under the name Ceresan M. It was given orally in gelatin capsules to four cattle in daily doses ranging from 11·2 to 224 mg./kg. body wt., for up to 38 days. Another animal (a steer) was given a single dose of 140 mg./kg. without apparent effect. Those given daily doses started to show nervous symptoms after 36, 23 days (low dose) or 3 days (high dose) and they died 2 days or 8 hours later. Absorption, distribution and excretion of the drug were studied. Electrocardiographic changes were recorded, and lesions in the brain and elsewhere were described.—R.M.

O'Byrne, T. & Yeast [Keast], J. C. (1960). **Mortalities of sheep after arsenic dipping.**—Aust. vet. J. **36**, 181-186. **1588**

Histories of mortality following dipping in arsenical preparations are reviewed. In most cases factors which could have delayed drying were involved. In some the arsenic content of liver, kidneys, and other organs was determined and the significance of these values is discussed. Attempts to induce arsenical poisoning by percutaneous absorption failed, and the authors suggest that in dipping accidents some arsenic may be ingested in addition to that absorbed percutaneously (the majority of accidents occurred with plunge dips).

Points raised in discussion on the paper were: Economic loss caused by a dipping accident includes loss of wool as the result of "scalding", and mis-mothering of lambs; ulceration of the gall bladder has been noted as a common lesion in sheep dying of arsenical poisoning; shearing cuts were not considered to be important in connexion with the absorption of arsenic; sheep swallow the wash accidentally; deaths may be due to inhalation pneumonia and in cattle dips a glycerinated

arsenical formulation was more toxic than sodium arsenite.—N. P. H. GRAHAM.

Mukula, A.-L. (1960). **Detection of parathion poisoning.**—Acta pharm. tox., Kbh. **17,** 304-314. [In English.] **1589**

Four methods for isolation of parathion from biological materials (stomach contents and organs), and the purification of extracts, were described.—R.M.

Gallagher, C. H. (1960). **The effects of nicotinic acid in experimental carbon tetrachloride poisoning of sheep.** — Aust. J. agric. Res. **11,** 1009-1016. [Author's summary modified.] **1590**

A course of three daily i/p injections of 2 g. nicotinic acid, a precursor of pyridine nucleotides, afforded considerable protection to sheep against specific liver damage and dysfunction following a dosage of 50 ml. CCl_4 given into the rumen on the same day as the third injection. The protection was apparent in the histological picture, respiratory activity, and the concentration of acid-soluble materials which absorb light at 260 mμ.

One dose of 2 g. nicotinic acid injected i/p. or given by stomach tube into the rumen, gave a significant measure of protection against the loss from liver homogenates subsequent to a dose of CCl_4 of acid-extractable materials which absorb light at 260 mμ. Some protection was given by one dose administered by either of these routes at the same time as CCl_4 but the greatest protection was given by the administration of the nicotinic acid a day earlier. The test sheep tolerated very large doses of CCl_4 so that prophylactic value against lethal doses could not be assessed.

The results are discussed in relation to the field problem of deaths among sheep treated with carbon tetrachloride.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Anon. (1961). **Furaltadone condemned.**—Brit. med. J. January 28th, 264-265. **1591**

A discussion of trials in 79 patients reported in the *New Engl. J. Med.*, in which furaltadone, one of the nitrofurans, was ineffective against various bacterial conditions, caused side effects, and did not remain at bactericidal concentrations in the blood. This article concludes that its use may now be discontinued in favour of antibiotics.—M.G.G.

Uvarov, O. (1960). **The concentration of some antibiotics in the milk after intramammary infusion.**—Vet. Rec. **72,** 1228-1231 & 1232. [Author's summary modified.] **1592**

Persistence of antibiotics in milk was studied in lactating animals after intramammary infusion of pencillin, of streptomycin, of a combination of penicillin and streptomycin or of novobiocin in mineral oil plus aluminium monostearate base, at different concentrations. The concentration of penicillin in the dry udder infused for prevention of dry cow mastitis was also recorded. The rate of excretion of the different antibiotics varied; this may have a bearing on intramammary formulations in current use.

Till, D. H., Barson, G. F., Bevis, M. A. & Hurst, L. (1960). **A survey of antibiotic sensitivity tests.** — J. med. Lab. Tech. **17,** 133-143. **1593**

The sensitivity of 5 strains of staphylococci and one strain of streptococcus was assessed independently by 33 laboratories using their routine methods. The possible reasons for the lack of agreement on the sensitivity of certain strains to certain antibiotics were discussed. Discrepancies would be avoided by strict standardization of the test and the use of controls.—M.G.G.

Watson, K. C. & Joubert, S. M. (1960). **Haemagglutination of cells treated with antibiotics.**—Nature, Lond. **188,** 505-506. **1594**

Thirty of about 3,000 human sera agglutinated red blood cells previously exposed to penicillin, and 6 of 1,700 agglutinated r.b.c. exposed to chloramphenicol. The reaction was specific for each antibiotic and could be inhibited by the appropriate antibiotic. All except 2 of the 30 sera agglutinating r.b.c. exposed to penicillin were from patients that had been treated with penicillin, but there was no history of treatment with chloramphenicol in 5 of the 6 patients whose serum agglutinated r.b.c. treated with this antibiotic. Haemagglutinins were not found to r.b.c. exposed to streptomycin, dihydrostreptomycin or tetracycline. It was suggested that certain antibiotics may act as haptens, and that some sera may contain an additional fraction in the prealbumin moiety which may or may not be of immune origin.—M.G.G.

Talbot, L. M. (1960). **Field immobilization of some East African wild animals and cattle—I.** —E. Afr. agric. J. **26**, 92-102. **1595**

The 2 most promising drugs for immobilizing wild game are gallamine triethiodide (Flaxedil) and suxamethonium chloride. They are adminstered i/m through a syringe in the form of a dart which is fired from a gun. Drugs used for tranquillizing wild animals before transport by motor vehicle are chlorpromazine and ethyl isobutrazine (Diquel). So far 203 wild animals of 11 species and about 100 cattle and captive wild animals have been immobilized and 15 animals of 3 species have been transported to new areas.—M.G.G.

See also absts. **1347** (chlortetracycline in listeriosis); **1405** (flavofungin in avian pneumonomycosis); **1420** (metronidazole, a systemic trichomonacide); **1422** (coccidiosis); **1518, 1521 & 1525** (parasiticides); **1526, 1530 & 1535** (anthelmintics); **1665** (dispensatory of the U.S.A.).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Symington, R. B. (1960). **Studies on the adaptability of three breeds of sheep to a tropical environment modified by altitude. I. The annual fluctuation in body temperature and body temperature increase between 6.30 a.m. and 12.30 p.m. II. Responses in body, skin and coat temperatures, cardio-respiratory frequencies and rate of moisture secretion of ewes to the diurnal fluctuation in ambient temperature during the hottest part of the year. III. The response of mature and young rams to a thermal burden induced by exercise. IV. Role of the fleece in thermoregulation in German Merino ewes.**—J. agric. Sci. **55**, 287-294; 295-302; 303-310 & 311-315. [Abst. from author's summaries.] **1596**

I. Early morning and midday body temperatures of three breeds of sheep were measured once weekly for 10 months in Northern Rhodesia and 12 months in Southern Rhodesia. In each breed seasonal fluctuations in body temp. were due to fluctuations in ambient air temperature. Mean annual body temperatures were: Merino 102·2°; Persian 101·7° and Native 101·7°F. Wool and hair breeds differed considerably in their early morning temperatures and in their body temp. increases from 6.30 a.m. to 12.30 p.m. Mean annual values for these measurements were: Merino 101·73 and 1·92°; Persian 100·81 and 1·83°; Native 100·73 and 1·92°F. At all times Merinos showed much greater uniformity of body temp. than either hair breed. There was no evidence that the thermoregulatory mechanisms of these animals had been stressed unduly. Black-coated Native ewes had higher initial body temperatures and a smaller body temp. increase during summer in S. Rhodesia than brown or broken-coloured Native ewes. These effects were due to differences in coat density rather than to differences in coat colour or skin pigmentation. In each breed the magnitude of the diurnal and annual variation in body temp. was different in N. and S. Rhodesia. Differences were largely of climatic origin but low level of nutrition in S. Rhodesia possibly reduced critical body temp. and impaired thermoregulatory ability.

II. Responses in body, skin and coat temperatures, cardio-respiratory frequencies and rate of moisture secretion of ewes of the above breeds to the diurnal fluctuation in ambient temp. were recorded in the presence and absence of drinking water during the hottest part of the year.

In hair breeds moisture secretion depended on insensible perspiration; consequently, rate of moisture secretion changed with body and air temperatures. In Merinos moisture for skin surface evaporation was provided by sensible and insensible perspiration. Native sheep may be able to sweat at temperatures higher than those recorded but it is unlikely that Persians have a sweating mechanism.

In each breed coat temp. was related closely to ambient temp. and changes in solar conditions evoked immediate response in coat temp. Merino fleece apparently stabilized skin temp. whereas Persian and Native hair did not.

III. Mature and young rams of these 3 breeds were made to run 1 mile in 10–12 min.; the response to the thermal burden so induced was measured in terms of body and skin temperatures, respiration rate, and length and temp. of the scrotum. Each of these responses was greatly increased immediately after exercise. Body, skin and scrotal temperatures returned to normal within 2 hours but respiratory rate remained elevated for a further 4 hours. There were breed differences in the initial and subsequent measurement of each response. In each breed respiratory evaporation was the principal thermolytic process. Rate of respiration was a sensitive indicator of thermal stress but it could not be used as an index of heat tolerance because the associated

changes in respiratory volume were not known. Increase in scrotal pendulance was related inversely to ability to maintain normal body temp.

In view of the influence of age and body conformation on the response to exercise it was questioned whether comparable heat tolerance indices could be obtained by this method.

IV. Unshorn Merino ewes had more and shorn Merino ewes less effective body temp. regulation than Persian or Native ewes. High heat tolerance in unshorn Merinos was primarily due to insulation by the fleece and not to more efficient physiological thermolysis than in hair breeds. No ewe showed signs of undue thermal stress and feed intake was not affected by heat. The longer the fleece, the smaller was the diurnal fluctuation in skin temp. But partly shorn ewes began with and maintained highest skin temp. through the heat of the day. In all groups skin temp. fell after 10 a.m. although ambient temp. continued to rise. This fall could not be attributed to sweating since moisture secretion declined simultaneously.

Armstrong, D. G., Blaxter, K. L., Clapperton, J. L., Graham, N. McC. & Wainman, F. W. (1960). **Heat production and heat emission of two breeds of sheep.** — J. agric. Sci. **55,** 395-401. [Authors' summary modified.] **1597**

In 52 experiments with two Cheviot and two Blackface wether sheep, heat production and heat emission were determined at environmental temperatures of 8°, 20° and 32°C. Initially the sheep were closely clipped to within 1–2 mm. of the skin and the fleece was then allowed to grow throughout the experiments.

At 32° fleece length did not influence heat production. At 20° metabolism was elevated until fleece length exceeded 18 mm. At 8° metabolism was elevated until fleece length exceeded 35–40 mm. No differences were found between the two breeds in their heat production at a particular temperature provided fleece length was identical.

The sensible loss of heat divided by the temperature gradient from the rectum to the environment (conductance) was linearly related to the logarithm of fleece length, both at environmental temperatures above and below the critical temperature.

No differences between the two breeds or between them and Down Cross sheep were found in conductance when devoid of fleece. The insulation provided by unit length of fleece was the same in all three breeds and crosses. The fleece of the Blackfaces grew twice as quickly as that of the Cheviots so that at a given time after shearing, the Blackfaces were more resistant to cold.

Loss of heat by the vaporization of water and skin and fleece surface temperatures did not differ between breeds.

Analysis of the relation between heat conductance and fleece length suggests that vasoconstriction and vasodilatation border on all-or-none effects.

Dowling, D. F. & Nay, T. (1960). **Cyclic changes in the follicles and hair coat in cattle.** — Aust. J. agric. Res. **11,** 1064-1071. [Authors' summary modified.] **1598**

In cattle in Australia the hair follicles undergo two resting and two active phases in a year, even in a tropical environment.

Lyne, A. G. & Heideman, M. J. (1960). **The pre-natal development of skin and hair in cattle. II. Bos indicus L. × B. taurus L.** — Aust. J. biol. Sci. **13,** 584-599. [Authors' summary modified.] **1599**

Histological study was made of the development of the skin and hair follicles in 22 Brahman × Hereford or Brahman × Shorthorn foetuses, aged from 77 to 263 days, and in three new-born calves. The initiation of hair follicles begins at about the 78th day of gestation in all regions, continuing to about the 140th day on the head, 160th day on the back, and 180th day on the midside. Three follicle types (first [A]-, later [B]-, and last-formed [C]) were recognized. All follicle types on the head are slightly more advanced than those of the trunk positions. Up to about the 140th day of gestation the follicle density is greatest on the head. The density of the follicles on the midside resembles that found in *B. taurus.* No difference in skin thickness between *B. indicus* × *B. taurus* and *B. taurus* was detected.

Hughes, H. V. (1960). **The skin of the dog.** —Brit. vet. J. **116,** 340-349. **1600**

A review of the structure of mammalian skin with particular reference to that of the dog, with the comment that the study of the skin of domestic animals has not kept pace with recent advances in human dermatology.

—Joyce E. Hammant.

Thorsell, W. & Nordberg, B. K. (1960). **Spreading activity in bovine udder extract.**—

Acta vet. scand. **1**, 324-346. [In English. Summaries in Swedish and German. Authors' summary modified.] **1601**

A spreading factor in udder tissue of cows was demonstrable by i/d injection of an extract of the tissue together with Evans blue dye into the skin of rabbits, and of cows. Activity was most evident in extracts obtained from pregnant cattle. It was associated with a component or components in the extract, probably protein, which increased vascular permeability and lysed connective tissue. Udder extract also had a spreading effect on bacteria. Its bacteriostatic effect was weak.

Linzell, J. L. (1960). **Transplantation of mammary glands.** — Nature, Lond. **188**, 596-598. **1602**

Autotransplantation of half the udder was achieved in 4 goats just before the end of a first pregnancy, and in 2 goats in full lactation. In the pregnant animals, the gland was moved in stages to a position over the last ribs, and although the nerve supply was cut at an early stage, a new blood supply was given time to develop. In the lactating goats, the gland was moved in one operation to the ventral surface of the neck, a new blood supply being made *via* the carotid artery and external jugular vein. In the former group only 70% of the expected milk yield was obtained, whereas 75–90% yields were obtained from the other two goats, after 6 weeks. It was found possible to obtain 80–98% of the goat's milk without the milk ejection reflex.

—Joyce E. Hammant.

Maqsood, M. & Reineke, E. P. (1960). **In vitro uptake of I-131 by mammary tissue.**—Amer. J. Physiol. **199**, 829-832. **1603**

Mammary tissue of rat, mouse, g.pig, rabbit and cow was incubated in a defined nutrient medium for between 15 min. and 6 hours in the presence of radio-iodine. Uptake of iodine was 10–15 times greater than uptake by liver, muscle, or boiled mammary tissue.

—R.M.

Garner, R. J., Sansom, B. F. & Jones, H. G. (1960). **Fission products and the dairy cow. III. Transfer of ^{131}iodine to milk following single and daily dosing.** — J. agric. Sci. **55**, 283-286. [Authors' summary modified.] **1604**

The transfer of ^{131}I to milk was studied in dairy cows after oral administration of carrier-free material in single doses as sodium iodide or as elementary iodine and in daily doses as sodium iodide.

The total recovery from milk during the 6 days following administration of a single dose in 28 experiments on 15 cows ranged from 1·3 to 19·4% (mean 5·5%) of the dose. The variations in recovery can be attributed largely to differences in the milk yield.

There was no significant difference in the biological availability of ^{131}I administered as iodide or iodine.

The change in concentration of ^{131}I in milk with time following daily dosing did not follow the predicted course, a peak value being observed in most animals after 1–3 days, followed by a fall and a subsequent rise to a steady value lower than was expected.

The presence of a concentrating mechanism in the udder was demonstrated by administration of sodium thiocyanate: the concentrating ability appeared to be lower in summer than in other months.

I. Tashenov, K. T. (1959). **[Secretory activity of the parotid glands of sheep under various types of feeding and management.]**—Trudy Inst. Physiol. Akad. Nauk Kazakh. SSR **2**, 30-39. [In Russian.] **1605**

II. Bazanova, N. U. & Tashenov, K. T. (1959). **[Secretory activity of the parotid glands of a camel deprived of water.]**—Trudy Alma-Atinsk. zoovet. Inst. **11**, 406-415. [In Russian.] **1606**

III. Trofimova, R. M. (1959). **[Nervous regulation of salivary gland function in sheep and camels.]** — Ibid. 421-432. [In Russian.] **1607**

I. Greatest salivation occurred in sheep fed silage, concentrates and hay, lowest in sheep fed grass. The pH of saliva was 8·9 during silage feeding, 8·76 during fodder-beet feeding and 8·58 during grass feeding. Salivation was less during summer pasturing than during winter housing. Non-protein nitrogen accounted for 78–82% of nitrogen compounds in saliva. The volume of saliva collected from sheep in which the terminal papilla of the duct was exteriorized (Pavlov-Glinsk method) was 3–4 times greater than from sheep with a cannula inserted into the duct where it crosses the masseter muscle.

II. A bactrian camel aged 5 years with an exteriorized terminal papilla of the parotid duct was studied during 15 days without water in a climate with a temperature range of 19°–38°C. and relative humidity at 32–48%. Changes in volume, pH, water content and dry-matter content are shown in 7 tables.

III. T. studied the reaction of two sheep

and a camel, each with an exteriorized parotid duct, to injections of pilocarpine, atropine or sodium bromide. Bromide increased salivation for 2 hours after injection. Salivation ceased 20 min. after injection of pilocarpine and this effect lasted for 90 min. Atropine reduced salivation, sometimes stopping it, for the same length of time. T. believed that the autonomic nervous system controlled loss of water in camels.—R.M.

Baĭmukkambetov, K. (1959). **[I. Growth, development and topography of the gastro-intestinal tract in sheep embryos. II. Embryogenesis of the forestomachs and abomasum in sheep.]** — Trudy Alma-Atinsk. zoovet. Inst. **11**, 462-471 & 472-493. [In Russian.] **1608**

B. studied 38 embryos and 6 lambs of the Kazakh fine-wooled breed. There are 8 topographical drawings and 18 photomicrographs. —R.M.

Payne, J. M.; Sanson, B. F., Garner, R. J., Thomson, A. R. & Miles, B. J. (1960). **Uptake of small resin particles (1-5 μ diameter) by the alimentary canal of the calf.** —Nature, Lond. **188**, 586-587. **1609**

Resin beads, reduced to a size of 1–5 μ were labelled by adsorption of Au-198, so that the final product contained 50 mg. resin, labelled with 40 millicuries of Au-198. This was fed, with milk, to a calf aged 6 weeks which was killed 72 hours later. Various tissues were removed and their radioactivity estimated. Histological sections were also covered with auto-radiographic stripping film to determine the localization of this activity. Activity was relatively high in the tonsil and lymph nodes and particles were traced in the walls of tonsil, pharynx, small intestine and cells of the reticulo-endothelial system, particularly lymph nodes and spleen. It was concluded that these small particles were able to penetrate the mucous membranes in a manner apparently similar to that of bacteria. —Joyce E. Hammant.

Fina, L. R., Sincher, H. J. & De Cou, D. F. (1960). **Evidence for production of methane from formic acid by direct reduction.**—Arch. Biochem. **91**, 159-162. **1610**

Formic acid may be reduced by rumen micro-organisms to methane without prior dehydrogenation.—R.M.

I. Fomina, N. V. (1959). **[Role of the digestive tract in calcium and phosphorus metabolism in sheep and camels.]**—Trudy Inst. Physiol. Akad. Nauk Kazakh. SSR **2**, 65-71. [In Russian.] **1611**

II. Trofimova, R. M. (1959). **[Nervous regulation of some digestive processes in the duodenum of sheep and camels. Part I.]**—Ibid. 72-83. [In Russian.] **1612**

III. Stepankina, M. K. (1959). **[Dynamics of nitrogen compounds in the duodenum of sheep and camels with various illnesses.]**—Trudy Alma-Atinsk. zoovet. Inst. **11**, 416-420. [In Russian.] **1613**

I. Chyme from a duodenal fistula in a camel had a much lower calcium content than chyme from sheep. In the camel the Ca content was higher in summer than in winter. In ruminants absorption of ingested Ca was greatest in the abomasum whereas phosphorus was mainly absorbed posterior to the duodenum.

II. Action of atropine, pilocarpine and sodium bromide on composition of chyme was investigated in four sheep and a camel all provided with duodenal fistulas.

III. Observations on 2 sheep and 2 camels with peritonitis, following surgery for creation of duodenal fistula, indicated that the concentration of nitrogen compounds in chyme increased in proportion to the severity of illness.—R.M.

I. Tashenov, K. T. (1959). **[Secretory and enzymic activity of the pancreas in sheep.]**—Trudy Inst. Physiol. Akad. Nauk Kazakh, SSR **2**, 44-51. [In Russian.] **1614**

II. Stepankina, M. K. (1959). **[Participation of the sheep pancreas in nitrogen metabolism.]**—Ibid. 57-64. [In Russian.] **1615**

III. Trofimova, R. M. (1959). **[Regulation of enzymic activity of the pancreas in sheep.]** —Ibid. 84-90. [In Russian.] **1616**

I. T. referred to Russian studies of the pancreas in cattle and pigs; there was only one reference to sheep (N. A. Popov & A. A. Kudryavtsev, 1930). In the present work, 3 ewes having chronic fistulas of the pancreatic duct were used. Secretory and enzymic activity was greater in pastured sheep than in the same sheep fed hay and concentrates; it was lower than normal during oestrus. Showing food to sheep did not greatly change the pancreatic secretion; apprehension from the presence of a dog inhibited secretion.

II. Mixed juice from the pancreatic and bile ducts contained 41–68% residual nitrogen and 59–32% protein nitrogen.

III. Stimulation of the parasympathetic nervous system by means of pilocarpine

increased the diastase activity of pancreatic juice but did not affect trypsin activity in 3 ewes. The effect of sodium bromide was also studied.—R.M.

Bazanova, N. U. & Prokudin, A. V. (1959). **[Changes in the microfauna of the fore-stomachs of lambs during growth.]**—Trudy Inst. Physiol. Akad. Nauk Kazakh. SSR **2**, 3-7. [In Russian.] **1617**

First appearance of infusoria in the rumen of lambs did not always correspond with the commencement of intake of coarse food. Changes in the consistency of rumen contents influenced the numbers of infusoria: there were fewer in "liquid" contents than in "dry" contents. The lowest counts of infusoria occurred 4–5 hours after feeding, during maximum gas formation and change in pH to the acid side. Greatest infusorial counts (1,200 per cu. mm.) were found at 6 months of age; at 7–8 months the counts fell to the normal adult range of around 350 per cu. mm. —R.M.

Knudsen, E. (1960). **Electrolyte excretion in the cow, as influenced by variations in the urine flow.**—Acta vet. scand. **1**, 305-323. [In English. Summaries in Danish and German. Author's summary modified.] **1618**

In a series of cows mean values for the clearance of K, Na and Cl were calculated per 100 kg. body wt. All three clearances tended to fall during the experiments. There was no correlation between urine volume and electrolyte clearances. The plasma potassium level average was 3·9 mEq/litre and fluctuated greatly during the individual experiment, whereas the plasma levels of sodium (139) and chloride (102) were very stable.

Large doses of chlorthiazide moderately increased K excretion and reduced plasma K. Na and Cl excretion rose considerably during diuresis. Small doses of chlorthiazide did not influence potassium excretion, but reduced plasma K, slightly increasing the percentage excreted. The effects on Na and Cl were the same in principle as after large doses.

Mersalyl greatly increased excretion of Na and Cl during diuresis. Potassium excretion was unaffected. Treatment caused acute mercury poisoning in two cows.

Campbell, D. E. S. (1960). **Improved method for collecting and measuring ureteral urine flow in the chicken.**—Acta pharm. tox., Kbh. **17**, 205-212. [In English.] **1619**

The collection technique described by I. Sperber (1948) was modified to allow simultaneous measurement of the rate of flow. —R.M.

Race, G. J. & Hsiao May Wu. (1961). **Adrenal cortex functional zonation in the whale (Physeter catadon).**—Endocrinology **68**, 156-158. [Authors' abst. modified.] **1620**

Adrenal glands from adult sperm whales *(Physeter catadon)* were grossly separated into the three cortical zones. Each of these was subjected to solvent extractions, and to column and paper chromatography. Chemical determinations of total recovered aldosterone, 17-hydroxycorticoids and 17-ketosteroids were made. The findings supported the functional zonation theory. The presence of aldosterone in the outer zones of the adrenal cortex even in mammals drinking sea water is noted.

De Groodt, M., Sebruyns, M. & Lagasse, A. (1960). De ultra struktuur van bloed-luchtbarriere in de long van vogels. **[Ultra-structure of the blood-air barrier in lungs of birds.]** — Vlaams diergeneesk. Tijdschr. **29**, 313-317. [In Flemish.] **1621**

The lung capillaries of chicks aged 6 months were washed free of blood and the lungs were then prepared for electron microscopy. The structure of the blood-air barrier was similar to that in mammals, amphibia and lung-fish.—R.M.

Thiéry, G. (1960). Note sur l'histologie du mufle des bovidés de l'ouest africain. **[Histology of the muzzle in West African cattle.]** — Rev. Élev. **23**, 155-159. [Summaries in English and Spanish.] **1622**

A description of the structure, blood supply and nerve supply of the muzzle. —T.E.G.R.

Wünsche, H.-G. (1960). Vergleichende papier-elektrophoretische Untersuchungen an Abortus-Bang- und tuberkulosefreien, klinisch gesund erscheinenden Rindern verschiedenen Alters. **[Paper electrophoresis of serum from healthy cattle of different ages, in herds free from brucellosis and tuberculosis.]** — Arch. exp. VetMed. **14**, 691-709. **1623**

Sera from 150 healthy cattle were submitted to paper electrophoresis. The results were classified by age groups ranging from 1 week to 4 years and over. W. confirmed that normal individual variations were too great to permit the use of paper electrophoresis in diagnosis of disease.—R.M.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Tomlinson, A. R. (1960). **The success of the rabbit "killer" trials.**—J. Agric. W. Aust. **1,** 1105-1106 & 1109-1111. **1624**

Details of operation and costs of a successful two-year trial are given. Trained officers did the actual work of destruction (mainly poisoning by "1080") instead of relying on the farmers.—A. CULEY.

McDonald, I. W. (1960). **The Ian Clunies Ross Animal Research Laboratory, Prospect, New South Wales.** — Nature, Lond. **187,** 980-982. **1625**

The Sheep Biology Laboratory at Prospect, New South Wales, was renamed in tribute to the late Sir Ian Clunies Ross. There are 24 laboratories in the main building, completed in 1959, and an isolated laboratory block is being built for research with radio-isotopes. The staff of 42 graduates and 56 technical assistants are investigating the effects of light and temp. on the sexual activity of ewes; oestrogens in pasture plants; the processes of transport of spermatozoa, fertilization and implantation; the metabolism of the pregnant ewe; the physiology of the new-born lamb; and the physiological mechanisms governing wool growth. Invaluable research tools are the two respiration chambers, and the two climate rooms, one of which is fitted with a wind tunnel.

—M.G.G.

Priedniek, O. K. & Stukonozhenko, P. I. (1960). **[Development of veterinary affairs in Latvia since 1940.]**—Veterinariya, Moscow No. 12 pp. 10-14. [In Russian.] **1626**

The research institute of microbiology of the Latvian Academy of Science in Riga is still directed by its founder, A. M. Kirkhenstein. It has a veterinary department. About 50 veterinary surgeons qualify each year from the Latvian Agricultural Academy. Four agricultural technical schools turn out about 50 veterinary 'feldshers' annually. There are at present 1,300 "veterinary specialists" in the country, at 37 district clinics, 208 veterinary posts, 68 feldsher posts, 55 meat, milk and food-inspection stations, one veterinary bacteriological laboratory, 12 inter-district bacteriological laboratories, and 17 disinfection units.

Foot and mouth disease was eradicated in 1945 and the incidence of rabies, brucellosis, anthrax, swine erysipelas, swine fever and fowl plague has been greatly reduced. Losses from helminths and protozoal infections were also reduced. As part of a campaign for reduction of bovine infertility, 18 A.I. centres were established.

The Research Institute of animal husbandry and veterinary science (Director: Y. M. Berzin) studied unthriftiness of cattle in coastal districts, apparently caused by deficiency of trace elements. Average annual milk yield increased from 1,859 kg. in 1937 to 2,637 kg. in 1959. The authors are Head of Veterinary Services and Chief Veterinary Surgeon, respectively.—R.M.

See also absts. **1482** (meat hygiene significance of salmonella in swine fever); **1506** (animal viruses and relationship to diseases in man); **1524** (sarcoptic mange in man from foxes); **1658** (the veterinary inspector, New South Wales); **1661** (report, Veterinary School, Alfort); **1666** (German meat inspection legislation).

REPRODUCTION AND REPRODUCTIVE DISORDERS

Tallis, G. M. & Young, S. S. Y. (1960). **Some aspects of the efficiency of large-scale artificial insemination operations in sheep.**—Aust. J. agric. Res. **11,** 1017-1025. [Authors' summary modified.] **1627**

The problems of estimating each day the proportion of ewes coming into oestrus for the first time and the proportion not returning after the first service were studied in relation to large-scale artificial insemination. These studies were used to examine data from some 700 Merino ewes which had been artificially inseminated. It was concluded that the methods described for estimating conception rates gave satisfactory results.

Riddell-Swan, J. H. (1960). **Artificial insemination of pigs in Japan.**—Brit. vet. J. **116,** 443-447. **1628**

A brief account is given of the training of boars for semen collection, collection technique, examination, storage, transportation and distribution of semen, and insemination of the sow. A brief description is given of the organization at Kanagawa, a typical Japanese system.

The Animal Reproduction Unit of the National Institute of Agricultural Science at Chiba is the main centre for research on artificial insemination in pigs.—T.E.G.R.

Hafez, E. S. E. (1960). **Analysis of ejaculatory reflexes and sex drive in the bull.**—Cornell Vet. **50**, 384-411. **1629**

A review incorporating 61 selected references with a practical bias, mainly towards making the best use of bulls in A.I. centres. Ejaculation, triggered through the sacral autonomic nerves, can function quite independently of the motor copulatory pattern. Low sex drive is associated not with a low level of nutrition, but usually with boredom. But deficiencies of protein, phosphorus or carotene can have adverse effects.

—F. L. M. Dawson.

van Duijn, C., Jr. (1960). **Effect of acridine orange on living bull spermatozoa.**—Nature, Lond. **187**, 1006-1008. **1630**

Photo-electric measurement revealed that the movement and velocity of spermatozoa from 4 bulls decreased in proportion to the concentration of acridine orange. After contact for 12 min. with a concentration of 1 : 10,000 at 37°C., the proportion of spermatozoa with normal movements was 80% of that in untreated samples, and the velocity was 62%.—M.G.G.

Mitscherlich, E. & Paufler, S. (1960). Über eine hämolysierende Substanz im Bullensamen. **[A haemolytic substance in bull semen.]** — Dtsch. tierärztl. Wschr. **67**, 614-617. [Summary in English.] **1631**

A substance capable of dissolving ox and sheep r.b.c. was demonstrated in ejaculated bull semen and seminal plasma, and also in seminal vesicles, but not in any other part of the genital system of bulls. It could not be dialysed, it was almost completely inactivated by exposure to 70°C. for 15 min., and it could be removed from the seminal plasma by precipitating the protein fraction with ammonium sulphate. Its varying concentration in the semen of 10 bulls was not correlated with fertility nor with the motility of the spermatozoa.—M.G.G.

Blackshaw, A. W. (1960). **The effects of milk diluents on the viability of ram spermatozoa and their revival after freezing.**—Aust. vet. J. **36**, 432-435. **1632**

Heating fresh pasteurized milk at 85° or 95°C. for 3 min. removed a factor toxic to ram spermatozoa. Samples of powdered milk did not show this toxicity and were unaffected by heating.

There were no significant differences between egg yolk–citrate and reconstituted skim-milk powder when tested as diluents for deep freezing. Both were superior to fresh milk. The addition of glycerol to the milk diluent at 5°C. gave better revival rates than at 29°C. and when 18 hours' equilibration was given. In later experiments 18 hours' equilibration was not superior to 30 min. when 7%, 9% and 11% w/v skim-milk powder, and 3·75%, 7·5% and 15% v/v glycerol were tested in all combinations. The highest level of milk powder (11%) with either 3·75% or 7·5% glycerol gave the most suitable diluent.

—I. Martin.

Whitney, L. F. (1960). **Further studies on the effect of Malucidin on pregnancy.** — Vet. Med. **55**, No. 12. pp. 57-65. **1633**

Further evidence is reported that in bitches Malucidin, a yeast extract, when injected i/v in a 3% refined concentrated aqueous solution in a dosage of 1 ml. per 3–3½ lb. body wt. will produce resorption of foetuses during the first two-thirds of pregnancy and abortion during the last third. To prevent the rapid fall of blood pressure which appears to be its principal pharmacological effect, 10% of the dose should be administered 10 min. before the main dose. Parturition began 23 hours ±2 after the injection and in every case, aborted puppies were surrounded by a placenta and foetal envelopes. Malucidin had no effect as a contraceptive and was not detrimental to the reproductive capacity of aborting bitches nor was their milk affected. The effects of Malucidin were similar in pregnant ewes and cats.—A. Ackroyd.

McClure, T. J. (1961). **Uterine pathology of temporarily-fasted pregnant mice.**—J. comp. Path. **71**, 16-19. [Author's conclusions modified.] **1634**

White mice were fasted once or twice for 48 hours commencing on the second, third or fourth days after mating. The fasting caused haemorrhage and necrosis of the deciduomata, death of the embryos, leucocytic invasion, liquefaction and absorption of the debris. When the fasting started on the third day lesions were present in all the mice examined one day after the end of fasting, and most of the debris had been absorbed by the end of the second day. The initial lesion was haemorrhage in and from the deciduomata.

Santamarina, E. & Joven, L. L. (1961). **A simple short assay of pregnant mares' serum**

gonadotrophin. — Acta endocr., Copenhagen **36,** 65-72. [In English.] **1635**

Following up their earlier work on a mouse test for pregnancy in mares [*V.B.* **30,** 906 & 4084] the authors examined the effect of a single s/c inj. of PMS on the genital tract of mice killed after 12 hours.—R.M.

Pigon, H., Lunaas, T. & Velle, W. (1961). **Urinary oestrogens in the stallion. Qualitative and quantitative investigations.** — Acta endocr., Copenhagen **36,** 131-140. [In English.] **1636**

The authors confirmed by chemical methods (including infra-red spectrography) the presence of oestradiol-17beta and oestrone in the urine of stallions; oestradiol-17alpha was also identified.

Only insignificant quantities of oestrogens were excreted during the first two years of life, but there was a pronounced increase at two years. Only traces were recorded in urine from ten adult geldings.—R.M.

Schmidt, K., Altenkirch, W. & Bachnick, G. (1960). Versuche zur Superovulation nach Progesteronvorbereitung, PMS- und Chorion-gonadotropinbehandlung beim Schaf. **[Trials with hormone-induced superovulation in sheep.]** — Zuchthyg. FortpflStörung. u. Besamung **4,** 263-278. [Summaries in English and Russian.] **1637**

Fifty-nine cross-bred sheep were treated with progesterone and pregnant mares' serum. Laparotomy was performed on these and on 12 untreated controls 2–4 days after the end of oestrus, in order to count the number of ovulations, intact follicles or cysts, ova present in oviduct and their degree of cell division. 65% of ova recovered from treated sheep were cleaved and the remainder were probably unfertilized.—R.M.

Moore, N. W., Rowson, L. E. A. & Short, R. V. (1960). **Egg transfer in sheep. Factors affecting the survival and development of transferred eggs.**—J. Reprod. Fertil. **1,** 332-349. **1638**

Employing the technique of egg transfer described by Hunter & others [*V.B.* **26,** 1029] the authors studied the effect of superovulation, breed of donors, number of eggs used for transfer, site of transfer and prenatal mortality.

The progesterone deficiency theory of early embryonic death was tested by R. V. Short (details published as an appendix on pages 347–349). He estimated blood progesterone in the sheep used by Moore & Rowson and was unable to correlate embryonic mortality with progesterone deficiency.—R.M.

Ward, D. N., Adams-Mayne, M. & Wade, J. (1961). **Association of luteinizing hormone activity with an acidic protein from sheep pituitary glands.**—Acta endocr., Copenhagen **36,** 73-82. [In English.] **1639**

Two fractions were isolated by chromatography from sheep pituitary glands. Fraction LH_1 was believed to be an association of fraction LH_2 with an acidic protein.—R.M.

Sorel, P. (1960). Essais de traitement des insuffisances gonadiques chez le taureau de centre d'insemination artificielle. **[Hormone treatment of low fertility in bulls.]** — Écon. et Méd. anim. **1,** 96-105. [Summaries in English and German.] **1640**

Five bulls affected with testicular degeneration, shown microscopically and by the conception rate falling steadily over three months, were treated three times with courses of 18 to 30 thousand i.u. of follicle-stimulating hormone in pregnant mare serum, given i/v in six equal doses at three days' interval. Three weeks intervened between each course. At the start of each course 750 mg. of testosterone hexahydrobenzoate was injected i/m. In four cases economically worthwhile results were claimed [though no untreated controls were left]; the fifth case retained no germinal epithelium at autopsy.

Two "slow" bulls received similar treatment, except that, instead of one, nine 500 mg. testosterone injections, three in each course, were given, with satisfactory results in each case.—F. L. M. Dawson.

Blom, E. & Christensen, N. O. (1960). **The etiology of spermiostasis in the bull. Studies on pathological conditions in the testis, epididymis and accessory sex glands in the bull. V.**—Nord. VetMed. **12,** 453-470. [In English. Summaries in German and Danish.] **1641**

Examination of 4,015 sets of genital organs revealed 61 cases of spermiostasis and a presumptive frequency of the condition of 2·1% in Friesian and 3% in Red Danish bulls was postulated. The primary lesion is the accumulation of spermatozoa in blind-ending rudimentary tubules within the epididymis lobes—a developmental error. Considerable evidence suggests that occurrence is genetically determined by a recessive hereditary factor.

—F. L. M. Dawson.

Healey, J. S., Wilson, J. M. & Gee, G. R. (1960). **Field investigations into infertility of dairy cattle in north eastern New South Wales.**—Aust. vet. J. 36, 447-454. [Authors' summary modified.] **1642**

Infertility was investigated in 93 herds. Mucus agglutination tests suggested that vibriosis was the greatest single cause of herd infertility; other conditions encountered or suspected were trichomoniasis, brucellosis, viral infertility, male infertility, and functional infertility. The control and therapeutic measures adopted are described, including treatment of vibriosis by infusion of streptomycin sulphate solution into the vagina before service.

Olsen, M. W. (1960). **Performance record of a parthenogenetic turkey male.**—Science 132, 1661. [Author's summary modified.] **1643**

A Beltsville Small White turkey poult of parthenogenetic origin hatched in spring 1958, matured, and produced semen containing viable spermotazoa. Semen from this male was used in January 1959 to inseminate 7 virgin and 7 previously mated females. Of 320 eggs incubated, 175 (54·7%) were infertile. From the 145 fertile eggs, 122 poults, about equally divided as to sex, hatched unaided.

See also absts. **1350** (puerperal E. coli sepsis in cows); **1353-1356** (uterine bactericidal activity); **1364-1378** (brucellosis); **1384-1385** (leptospiral abortion in cattle and sheep); **1394-1396** (bovine genital vibriosis); **1398** (abortion in cows in Victoria); **1408** (epididymitis in rams); **1414** (microflora of the genital organs in cows); **1470** (coital vesicular exanthema); **1474** (virus abortion in ewes); **1537** (increase in excretion of strongyle ova by cows at parturition); **1574** (report, disease, wastage and husbandry in British dairy herds).

ZOOTECHNY

Anon. (1960). **United Nations. Report of the first Near East meeting on animal production and health, held in Cairo, United Arab Republic, 4th-14th April 1960.** pp. 131. Rome: Food & Agriculture Organization of the United Nations. [FAO Meeting Report No. AN 1960/5.] **1644**

Delegates attending the conference were from 12 countries. The agenda comprised: improvement of livestock through breeding, improvement of the management and nutrition of livestock, animal climatology, sheep and goat production, poultry production, control of diseases and parasites, artificial insemination, uses of radio-isotopes and radiation, promotion of national livestock industries by governments, creation of a Working Party on animal production and health in the Near East, and establishment of a Near East Animal Health Institute. Delegates contributed information from their respective countries on the different items of the agenda. The recommendations included the creation of a Near East Working Party consisting of an Animal Production Committee and an Animal Health Committee; the establishment of a Near East Animal Health Institute consisting of units in five countries; a survey of livestock numbers and availability of foodstuffs in each country; the importation of exotic breeds for crossing with indigenous stock; and the establishment of stations for the selective breeding of indigenous sheep and goats.

—M.G.G.

Schleger, A. V. & Turner, H. G. (1960). **Analysis of coat characters of cattle.**—Aust. J. agric. Res. 11, 875-885. [Authors' summary modified.] **1645**

Various attributes of cattle coats are evaluated in terms of their repeatability and heritability, and their capacity to discriminate between coats of different breeds, but principally in terms of their correlations with a subjective coat score, with skin temperature, and with growth rate. The correlation of 0·7 between growth rate and coat score is almost equalled by the multiple correlation between growth rate and a group of measured coat characters, the most important being depth of coat and hair diameter followed by percentage of medullated hairs and maximum length of fine hairs; hair curvature and follicle angle contribute little. Bonsma's felting score provides a useful indication of coat type, but is consistently inferior to a coat score. Weight of hair per unit area of skin is unreliable, because it is dependent on length and diameter, which have opposing effects on coat quality. The relative value of different characters varies with circumstances: in late spring, depth was the most important but in winter and early spring it was exceeded in importance by a score of the amount of "body" in the coat. Though coat score is defined fairly completely in terms of component characters, it remains of greater value than any other assessment, presumably because it refers to the whole coat *in situ*, rather than to a small sample of clipped hair.

Arnold, G. W. (1960). **Selective grazing by sheep of two forage species at different stages of growth.** — Aust. J. agric. Res. **11,** 1026-1033. [From author's summary.] **1646**

In a series of experiments in which the rate of stocking was such that consumption exceeded growth, sheep continuously grazing pastures of lucerne or *Phalaris tuberosa* exhibited distinct preferences. On both forages sheep continuously selected leaf in preference to stem where this was physically possible. Within both leaf and stem fractions of the plants selection was for material of the highest available nitrogen content.

Selection preferences were exhibited more strongly the greater the amount of material present per unit area, *i.e.*, the more mature the plant. The process of grazing in a horizontal plane, together with selection in a vertical one, is also described.

Burns, M. A. & Sutherland, D. N. (1960). **Use of synthetic oestrogens for promoting weight gains in beef steers grazing on native pastures.** — Qd. J. agric. Sci. **17,** 39-42. [Authors' summary modified.] **1647**

On unimproved pasture, beef steers implanted with either 30 mg. or 60 mg. of hexoestrol made greater weight gains than controls. In one trial the controls graded higher than the treated animals, but in the other trial treated and untreated cattle graded equally well. Certain adverse effects (changes in conformation) were noted in treated steers.

Varnagiris, A. (1958). Ančiu ir žąsu kiaušiniu perinimo pagerinimas naudojant druskos rugšties, valgomos druskos ir kobalto chlorido tirpalus. [**Improving the hatchability of duck and goose eggs by dipping or washing them in 3% saline or 3% cobalt chloride solution.**] —Trudy Litovsk. vet. Akad. **4,** 149-155. [In Lithuanian. Abst. from Russian summary.] **1648**

Hatchability was increased by up to 20% for ducks and 10% for geese, compared with the hatchability of untreated eggs.—R.M.

Kushner, H. F., Dobrynina, A. Y., Kostin, I. G., Zubareva, L. A., Samoletov, A. I. & Salganik, M. G. (1960). **The effect of microdoses of ionizing radiation on poultry ontogenesis.**—J. agric. Sci. **55,** 365-369. [Authors' summary modified.] **1649**

An insignificant short-term increase in the natural dose of ionizing radiation during the embryogenesis period is beneficial not only for the embryonic development of the chicks, but also for their post-embryonic growth and development as well as the egg production of the pullets.

Irradiation of incubated eggs with microdoses of radioactive radiations may improve the economically useful properties of poultry.

Cass, J. S., Campbell, I. R. & Lange, L. (1960). **A guide to production, care and use of laboratory animals. An annotated bibliography.** — Fed. Proc. Suppl. No. 6 pp. 196. **1650**

This bibliography contains about 1,400 references taken from the period 1919–1959. In addition to the usual laboratory animals, it contains material on the domesticated animals, reptiles, fish, amphibia and others. References are arranged in chronological order under each of the headings: anatomy, physiology and psychology; diseases, abnormalities and injuries; nutrition; breeding; colony maintenance; procurement and use of animals; special techniques; administration of colonies; publications of general interest. There are indexes to authors and to subjects.—R.M.

Davis, J. W. C. (1960). **The establishment and maintenance of a mouse colony for the production of sucking mice.**—J. Anim. Tech. Ass. **11,** 44-50. **1651**

An account is given of the history over 4½ years of a colony of mice established at Pirbright in 1955 to supply 5,000 sucking mice weekly for foot and mouth disease investigations. Data include colony size from year to year, methods and efficiency of production and observations on mortality, disease control methods and their effect. The most troublesome condition has been infantile diarrhoea which has several times necessitated the closing of entire units and seems almost impossible to eliminate entirely. Its incidence appears to be associated with the density of mice in a unit. An outbreak of salmonellosis and one of Tyzzer's disease also occurred. In spite of disease, some 1,500 weaners are being produced and 400 litters issued weekly.

—A. Ackroyd.

Matscher, R. & Lupo, C. (1960). Sulla "incuria delle madri verso i piccoli" nell'allevamento del ratto albino. [**Lack of maternal instinct in albino rats.**]—Arch. Vet. Ital. **11,** 301-304. [Summaries in English, French and German.] **1652**

Of 3 groups each of 20 albino rats showing lack of maternal instinct one was treated with anterior pituitary hormone s/c,

the second with thyroid extract in the diet and the third was kept as untreated control. The phenomenon reappeared in 40% of the first group, in 70% of the second and in 90% of the control. It is considered that, gonadotrophic hormones, particularly prolactin, play an important part in the development of maternal instinct.—T.E.G.R.

See also absts. **1574** (report, disease, wastage and husbandry in British dairy herds); **1596** (adaptability of sheep to tropical environment); **1667** (book, animal husbandry heresies).

TECHNIQUE AND APPARATUS

Weyland, H. (1960). **The continuous flow culture of micro-organisms as a research tool in biology and biochemistry.**—J. S. Afr. vet. med. Ass. **31**, 7-13. **1653**

An account of the principles and applications of continuous flow culture of micro-organisms and of its advantages over batch culture.—M.G.G.

Gibor, A. (1961). **Concentration by freeze-thaw.**—Science **133**, 193-194. [Author's summary.] **1654**

A simple procedure for concentrating aqueous solution by freezing is described. Solutions are frozen in test tubes, which are insulated on the sides and bottom, and allowed to thaw during centrifugation. Fractionation of solutes could also be achieved.

Watson, J. W. (1960). **A note on open laparotomy to obtain liver samples from new-born lambs.**—Aust. vet. J. **36**, 472. **1655**

An account of a technique, which should be satisfactory under field conditions, for obtaining liver samples for copper analysis.
—A. Culey.

Law, G. R. J. (1960). **Blood samples from jugular vein of turkeys.**—Poult. Sci. **39**, 1450-1452. [Author's summary modified.] **1656**

A technique for obtaining blood samples from the jugular vein of fowls and turkeys is described. The use of conventional syringes, vacuum bottles and vacuum tubes for withdrawing blood is briefly discussed as well as some advantages of this route of entry.

Köhler, H. & Springer, D. (1960). Eine neue Methode zur Isolierung von Leukozyten. **[New method of isolating leucocytes.]**—Zbl. Bakt. I. (Orig.) **180**, 264-272. [Summaries in English, French, Spanish and Russian.] **1657**

A simple method for isolating leucocytes from the peripheral blood of fowls was based on adherence of the leucocytes to the walls of test tubes. Cells adhering to glass were examined like a tissue culture.—R.M.

REPORTS

Anon. Australia. (1959 & 1960). **The veterinary inspector. Institute of Veterinary Inspectors of New South Wales. Annual, 1959 and 1960.** pp. 96. and pp. 96. Sydney: The Institute. **1658**

Papers on the following topics are included in the 1959 volume of this yearbook: ovine brucellosis; some newer virus diseases of horses, cattle, pigs and sheep; cancer of the bovine eye; the effect of disease on animal production (statistics of costs are given); haemorrhagic diseases in chickens; sudan grass (*Sorghum sudanenese*) poisoning in cattle; apparent water intoxication of cattle (result of drinking after long rail journey in heat wave); bovine functional infertility; infertility of sheep on red clover (mention is made of the appearance of the uteri suggesting twin pregnancies and of an apparent oestrogenic effect of red clover on steers); an unusual case of traumatic balanitis in rams; the importance of the frequency of replenishment in "exhausting" sheep dips.

In the 1960 volume: Entero-toxaemia of cattle; leptospirosis; clinical aspects of equine infectious anaemia; cattle tick control; dietary deficiency of selenium; acetonaemia in dairy cattle; non-contagious ovine posthitis; muscular dystrophy in lambs; avian monocytosis; toxicity of the newer insecticides (chlorinated hydrocarbons and organic phosphorus compounds); lindane poisoning in calves; toxicity of phenothiazine in sheep; some recent advances in veterinary therapeutics; neo-natal mortalities of sheep; livestock transportation by N.S.W. Department of Railways.—A. Culey.

Tanganyika. (1960). **Annual report of the Department of Veterinary Services for the year ending 31st December, 1959.** pp. 59. Dar es Salaam: Govt. Printer. Shs. 6/-. **1659**

The Tsetse Survey and Reclamation Dept. was amalgamated with the Dept. of Veterinary Services on 1.7.59.

Shortage of professional staff (12 Veterinary Officers under establishment) hampers progress.

ANTHRAX is sporadic except in West Lake Province and Ufipa District of the Western Province. In Masailands and Usangu consumption of infected meat caused human mortality and cutaneous anthrax is not uncommon. Issue of free vaccine for livestock has stimulated control by vaccination. The incidence of BLACKLEG varies from sporadic to endemic throughout the Territory. Over a thousand deaths occurred even though twice as many animals were immunized. Isolated cases of ENTEROTOXAEMIA occurred in sheep. There were 25 deaths in one outbreak of HAEMORRHAGIC SEPTICAEMIA in Tanga Province. There was an increased incidence in the Northern Province among calves and immature sheep and goats. The vaccine is expensive and of poor keeping quality but is valuable if used at intervals of six months. Only 10,000 doses were used. There were two outbreaks of PARATYPHOID in calves. Three cases of JOHNE'S DISEASE were diagnosed. TUBERCULOSIS : Meat Inspection records in the Southern Province showed 7% of lungs were infected. No TB. was found in the Northern, Central, Western and Tanga Provinces where thousands of carcasses are inspected. In the Western Province the first cases of TB. in Ankole cattle from Uganda were confirmed. In the Eastern Province a few cases of TB. were found in tests of three dairy herds. In the Lake Province "SKIN TB." in cattle was confirmed. TB. in a dog was reported from the Western Province. STREPTOTHRICOSIS is common among zebu cattle. BOVINE CONTAGIOUS PLEUROPNEUMONIA : The only focus of infection is in Masailands. An outbreak occurred in two herds of cattle stolen from Kenya. These were slaughtered. The "Rapid slide agglutination test was unreliable". Over a thousand cattle were tested and the results compared with P.M. findings.

TRYPANOSOMIASIS occurs in most Provinces but the mortality is decreasing with the increased popularity of chemotherapy. Ethidium, dimidium and antrycide prosalt are used extensively. Berenil has also been used where drug fastness to the ethidium group is suspected.

There has been an improved outlook regarding dipping and an increase in the facilities for spraying or dipping animals. HEARTWATER (*Rickettsia ruminantium*) was reported from all Provinces except Western. CANINE RICKETTSIOSIS occurred at Mwanza and Bukoba. Only two outbreaks of RIFT VALLEY FEVER were recorded in dairy herds at Moshi. Vaccination eradicated the disease. Most of the horses are vaccinated annually against AFRICAN HORSESICKNESS. Four non-vaccinated animals died. Twenty-nine cattle died from BLUETONGUE in the Northern Province. Several outbreaks of CONJUNCTIVITIS AND OPHTHALMIA occurred in goats and sheep in all provinces. Most of these were non-specific but in Bukoba rickettsial ophthalmia was confirmed. Infectious forms occurred in Tanga and Iringa Districts and were very virulent in one outbreak, causing blindness. Treatment was ineffective and the cause obscure. Several outbreaks of CONTAGIOUS PUSTULAR DERMATITIS occurred among sheep and goats. Vaccination of one flock met with reasonable success. FOOT AND MOUTH DISEASE continued to smoulder throughout the Territory. "O" type virus is most common but the "A" type (S.A.T.2) occurred.

FOWL TYPHOID was common and caused heavy losses. Carriers are common among indigenous flocks. FOWL POX is equally common but of less importance economically. There was one severe outbreak among young turkeys.

Meat Inspection services in all major townships and at the two factories of Tanganyika Packers Ltd. were maintained by the Department. Training of Meat Inspectors was carried out at the canning factory at Dar es Salaam.

In trials at Mpwapwa of drugs used in the treatment of TRYPANOSOMIASIS, Prothidium tablets at 2·0 and 3·0 mg./kg. gave poor protection and Ethidium Suraminate 2·5 mg./kg. was of no value as a prophylactic under the challenge concerned. A complete protection was obtained by Antrycide Prosalt (new formulation) at two-monthly intervals. The poor results with Prothidium tablets are attributed to the excipient reacting with the active principle to render it inert.

Experiments carried out with a view to large-scale immunization of breeding cattle against EAST COAST FEVER show that further work is necessary.—J. A. GRIFFITHS.

Sarawak. (1960). **Annual Report of the Department of Agriculture for the year 1959.**

[Cook, J.] pp. 93. Kuching: F. W. Goodwin, Govt. Printer. $2.00. [Veterinary services pp. 54-56.] **1660**

Apart from pig-keeping, which is widely practised by the Chinese and non-Muslim communities, animal husbandry plays very little part in the rural economy. No rinderpest, foot and mouth disease, swine fever nor other epidemic disease occurred.

Prophylactic vaccination is free against HAEMORRHAGIC SEPTICAEMIA in cattle and buffaloes, PASTEURELLOSIS in pigs and NEWCASTLE DISEASE and FOWL POX in poultry. A very high proportion of the pigs appear to be affected by WORMS.

Increased attention has been given to fowl pox inoculation and this has led to fewer cases being reported. NEWCASTLE DISEASE is probably the most important disease limiting poultry production in Sarawak.

The veterinary clinic continues to provide facilities for diagnosis and treatment. The veterinary officer maintains a watching brief over the municipal officer who performs meat inspection and co-operates with him.

—D. S. RABAGLIATI.

Anon. (1960). Compte rendu des activités de l'École en matières de recherches pour l'année 1959. **[Review of research at the National Veterinary School at Alfort in 1959.]** pp. 31. Lyon: Imprimerie BOSC Frieres. **1661**

Items studied included toxicity of phosphorus-32, stages in ossification of the paw in cats, pathology of bone and lung in domestic carnivores, hydraemia in cattle, anthelmintic aerosols, life-cycle of *Angiostrongylus vasorum,* respiratory diseases of fowls, contagious canine rhino-tonsillitis, eye surgery, diseases of tendons. There is a list of papers published during 1959.—R.M.

BOOK REVIEWS

Gentles, J. C. [Edited by.] (1961). **Sabouraudia. Journal of the International Society for Human and Animal Mycology. Volume 1, Part 1.** pp. 72. Edinburgh (& London): E. & S. Livingstone. **1662**

This new journal, named after the mycologist Raimond Sabouraud, is the organ of the International Society for Human and Animal Mycology. The first issue contains an article on moniliasis in partridges by Keymer and Austwick, two papers on the pathogenicity of *Candida* spp., one on *Cryptococcus neoformans* and three on ringworm fungi, as well as notes and news about the Society. The subscription for a four-part volume is £4.

—R.M.

Röhrer, H. & Pehl, K.-H. (1960). Atlas der pathologisch-anatomischen und histologischen Diagnostik der Schweinepest. **[Atlas of the pathological and histological diagnosis of swine fever.]** pp. 67. Jena: Gustav Fischer. DM 44.50. **1663**

This work, intended for the practising veterinary surgeon and the diagnostic laboratory, has been compiled by Prof. Röhrer, President of the Friedrich-Loeffler Institute on the Island of Riems and Dr. Pehl, Head of the Epizootiological Department of the Institute. The Atlas is accompanied by a 12-page explanatory text. It comprises 71 plates, made up of 37 colour photographs of lesions, 24 photomicrographs, and 10 diagrams of distribution of brain lesions. Seven photomicrographs show specific brain lesions in swine fever, and another 5 present the lesions of Teschen disease for comparison.

The 10 colour plates of affected lymph nodes and the 61 other plates of spleen, kidney, bladder, stomach, intestine, and other organs are excellent and it is not necessary to know the German language to be able to appreciate them; they are better than any existing textbook illustrations.

Being printed on good paper of fairly large size (19 × 27 cm.) and mostly in colour this atlas is rather expensive—equivalent to something over £3, but the expense may well be justified for colleges and laboratories that do not have their own collection of swine fever material.—R.M.

Brues, A. M. [Edited by.] (1959). **Low-level irradiation. A symposium organized by the Section on Zoological Sciences of the American Association for the Advancement of Science, cosponsored by the United States Atomic Energy Commission and the Division of Biological and Medical Research of the Argonne National Laboratory, and presented at the Indianapolis meeting, December 30, 1957.** pp. ix + 148. Washington, D.C.: American Association for the Advancement of Science. [Publication No. 59]. 46s. **1664**

A symposium of papers dealing with the background irradiation of man; it is well produced but a somewhat expensive book for the general reader as well as the scientist.

The first part consists of four papers on the scientific background, and deals with the sources and extent of the various components of man's radiation dose and their effects on him. An interesting account of meteorological influences on the peregrinations of bomb fall-out leaves one feeling that a subsequent paper on the food chains by which this fallout finishes its journey to man should have been included, to complete this, otherwise good, general background.

The second part deals with the implications of these radiation hazards for society. It treats of the public health and publicity aspects, and the political, legal and moral issues.—M. K. LLOYD.

Osol, A. & Pratt, R. [Edited by.] (1960). **The dispensatory of the United States of America. 1960 edition. New drug developments volume. (Volume 2.)** pp. vi+240. Philadelphia & Montreal: J. B. Lippincott Company. (London: Pitman Medical Publishing Co.) 72s. **1665**

The 25th edition of this great Dispensatory was published in 1955 [*V.B.* **26,** 1478]. Now we have Volume 2 of the 25th edition, in which are described new drugs, official and non-official, introduced during the period 1955–60, as well as new information about drugs already described. Unlike its parent volume, this supplement does not contain a veterinary section. The combined price for volumes 1 and 2 is £12.—R.M.

Lerche, M., Bartels, H. & Kelch, F. [Edited by.] (1960). Schroeter, A./Hellich, M. Das Fleischbeschaugesetz nebst zusätzlichen Verordnungen und Gesetzen, mit Erläuterungen. Teil II. **[Meat inspection law, with explanations. Part II.]** pp. viii+366. Berlin (& Hamburg): Paul Parey. 7th edit. DM 26. **1666**

Part I of this four-part work has been reviewed [*V.B.* **30,** 312]. It contained general definitions of terms used in the new German meat inspection law of March 1960. Part II is concerned with Section A of the law; examination and public health treatment of slaughter animals and meat for inland consumption. As stated in the title, this book does not merely state the law, but also gives extensive explanations of it, which often include bacteriological and other techniques for detecting abnormalities, with references to the literature when necessary. Among other things, this section describes the procedure for bacteriological meat inspection and examination for *Trichinella*.—R.M.

Fraser, A. (1960). **Animal husbandry heresies.** pp. 200. London: Crosby Lockwood & Son Ltd. 16s. **1667**

This small book with its unusual and challenging title is an important one. Although written for farmers it contains much that will interest many kinds of veterinarians and cannot fail to stimulate thought. The author is particularly stimulating when he attempts to evaluate such things as the relative importance of feeding and breeding in producing the outstanding animal; the value of pedigree and progeny testing. Progeny testing is fashionable today and one might easily get the impression that it is a new discovery made by the modern geneticists but, as the author points out, it was the method used by the great "improvers" such as Bakewell, Cruickshank etc. As he phrases it the progeny testing stations for the Aberdeen Angus, Hereford and Beef Shorthorn breeds have been the prairies of North America and the pastures of three continents.

Throughout there are anecdotes with a humorous touch but the book is essentially a serious and important contribution to the problems posed by modern intensive methods of breeding, feeding and housing livestock.

Morris, D. & Jarvis, C. [Edited by.] (1960). **The international zoo yearbook. Volume I, 1959.** pp. 160. London: The Zoological Society. 40s. **1668**

Besides serving as a directory to zoological gardens throughout the world, this book contains 57 contributed articles, many of which will interest veterinarians, particularly in the section "Animal Welfare and Zoological Research" (pages 46–53). There are notes on the use of tranquillizer drugs and their administration by rifle-fired syringe; the animal hospital at London Zoo; griseofulvin treatment of a skin disease in an orang-utan; anthrax in a puma; "moose disease" in Canada. There is a special section of eight articles devoted to keeping apes in captivity. The directory lists zoos, senior zoo staff, species bred in captivity, and animal dealers. —R.M.

—. (1960). **British Postgraduate Medical Federation, University of London. Lectures on the scientific basis of medicine. Volume**

VIII, 1958-59. pp. ix + 467. London: University of London; The Athlone Press. 45s. **1669**

In this series of 24 lectures given by research workers for graduates in medicine and dentistry, the following should be of special interest to veterinary readers: Radiation as a toxic agent, by R. H. Mole; What are gamma globulins? by J. H. Humphrey; and Some aspects of iron metabolism, by D. F. Cappell.—M.G.G.

Schützler, G. (1961). Generalregister zum Archiv für wissenschaftliche und praktische Tierheilkunde 1875-1944, Bände 1-79 einschliesslich der Supplement-Bände. **[General index to "Archiv für wissenschaftliche und praktische Tierheilkunde" 1875-1944, volumes 1 to 79.]** pp. 128. Berlin (& Hamburg): Paul Parey. DM 28. **1670**

The 'Archive for scientific and practical veterinary medicine' was until 1944 one of the leading German veterinary periodicals. Dr. Schützler has compiled an index to authors and subjects of the 3,000 or so articles published in its 79 volumes. There are probably few libraries outside Germany that possess a complete set, yet all veterinary libraries will find in this index a valuable guide to German literature, especially for the period from 1875 to 1932 when, apart from the *Jahresbericht Veterinär-Medizin* which started in 1881, there was no comprehensive documentation of veterinary literature. The entries under authors' names give the full title, volume number, page numbers and date of each article—all the information needed for checking references.—R.M.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

Barnet, A. J. G. & Reid, R. L. (1961). **Reactions in the rumen.** pp. viii + 252. London: Edward Arnold. 40s.

Berrier, H. H. (1961). **Diagnostic aids in the practice of veterinary medicine.** pp. 191. St. Louis, Missouri: C. W. Alban & Co. 2nd edit. $4.75.

Brandly, C. A. & Jungherr, E. L. (Edited by) (1960). **Advances in veterinary science.** pp. xi + 382. New York (& London): Academic Press. 86s.

Comar, C. L. & Bronner, F. (Edited by) (1961). **Mineral metabolism: an advanced treatise. Volume I. Principles, processes, and systems. Part B.** pp. xv + 879. New York (& London): Academic Press. 103s. 6d.

Jacquot, R., le Bars, H., Leroy, A. M. & Simonnet, H. (1961). Nutrition animale. Biologie, physiologie et alimentation rationelle. Volume II. Données générales sur la nutrition et l'alimentation (suite). Tome II. Metabolismes et transits. **[Animal nutrition. Volume II, Part II. General principles of metabolism.]** pp. 965-1430. Paris: Baillière et fils. NF 45.

Koch, T. (1961). Zur Geschichte des Pferdes. **[History of the horse.]** pp. vii + 108. Jena: Gustav Fischer. DM 10.70.

Kon, S. K. & Cowie, A. T. (Edited by) (1961). **Milk: the mammary gland and its secretion. Volume I.** pp. xii + 515. New York (& London): Academic Press. 100s.

Nikolitsch, M. (1961). Die Tollwut: ihre neuesten Forschungsergebnisse. **[Rabies: recent advances.]** pp. 40. Stuttgart: Gustav Fischer. DM 5.80.

Pallaske, G. (1961). Pathologische Anatomie und Pathogenese der spontanen Tuberkulose der Tiere. **[Pathological anatomy and pathogenesis of spontaneous tuberculosis in animals.]** pp. x + 152. Stuttgart: Gustav Fischer. DM 28.

Skrjabin, K. I., Shikhobalova, N. P. & Shul'ts [Schulz], R. S. (1960). **Essentials of nematodology. Volume III. Trichostrongylids of animals and man.** pp. 704. Jerusalem: Israel Program for Scientific Translations [for the National Science Foundation, Washington, D.C., and the Department of Agriculture, U.S.A.]. 105s.

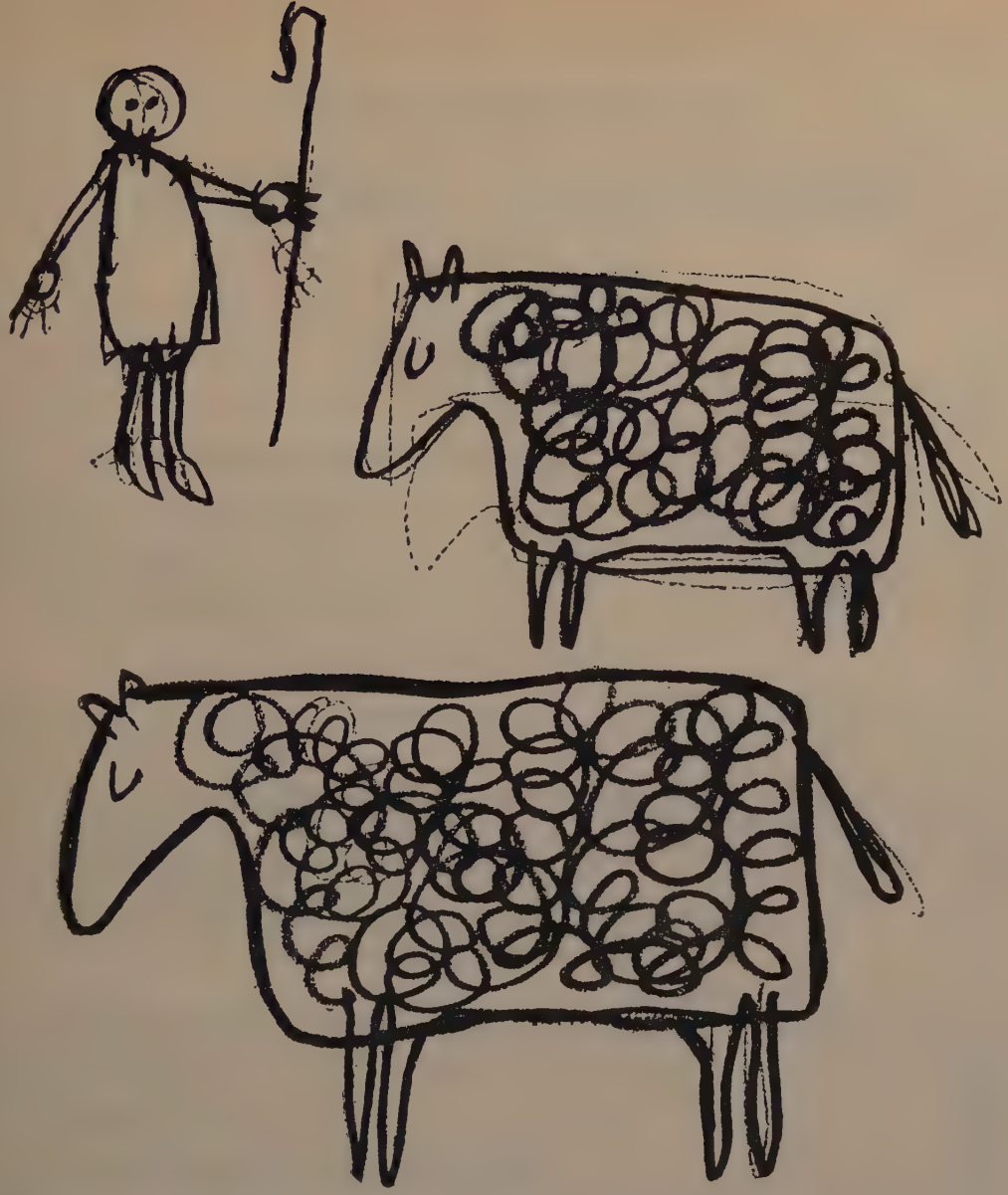
Smith, K. M. & Lauffer, M. A. (1960). **Advances in virus research. Volume 7.** pp. ix + 397. New York (& London): Academic Press. $10.00.

Smythe, R. H. (1961). **Animal vision. What animals see.** pp. 250. London: Herbert Jenkins. 25s.

Wood, R. K. S. (1960). **Biological problems arising from the control of pests and diseases. Symposia of the Institute of Biology, No. 9.** pp. viii + 120. London: The Institute of Biology. 25s.

—. (1960). **Techniques and procedures in animal production research.** pp. vi + 228. Beltsville, Maryland: American Society of Animal Production.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.



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